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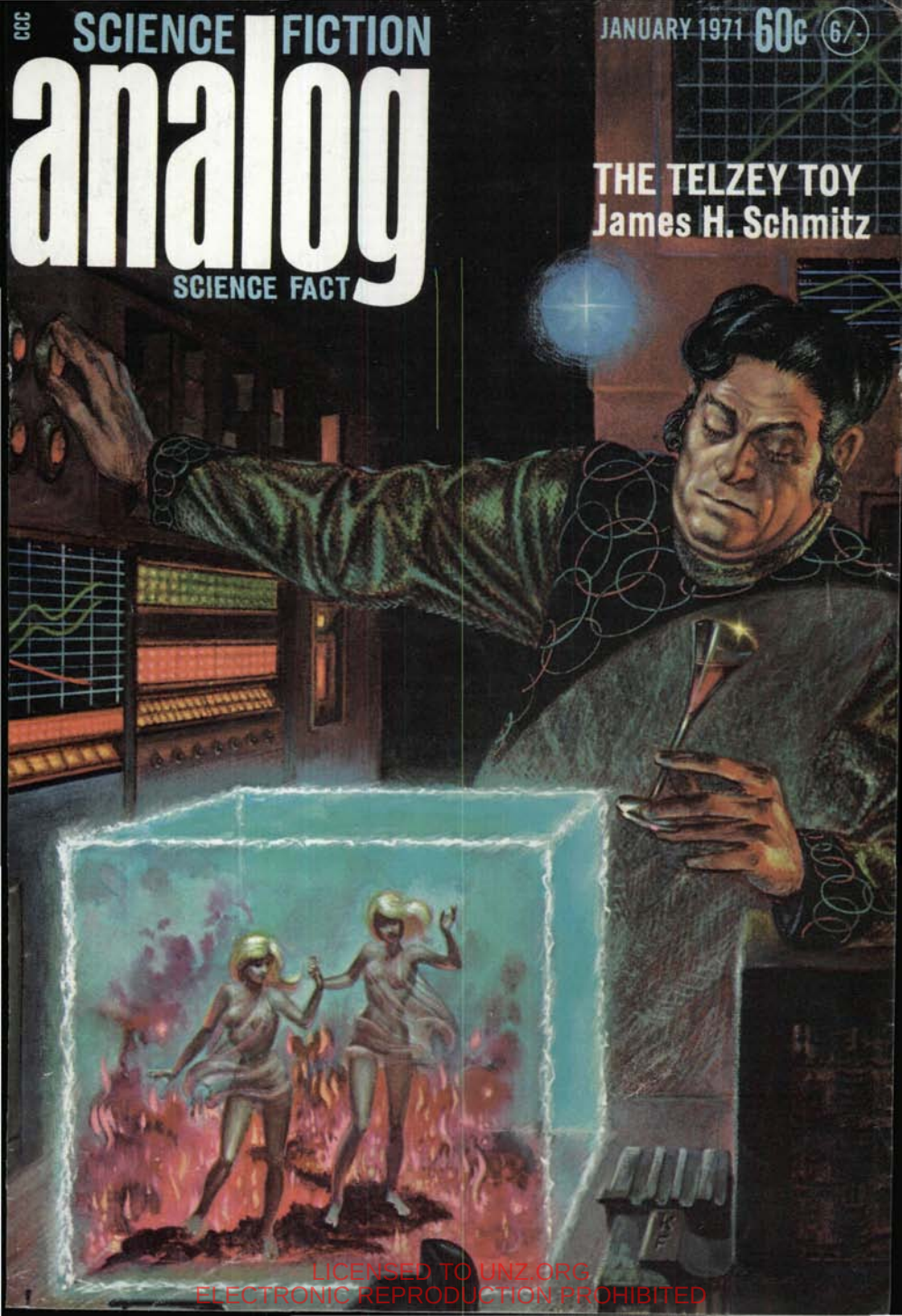
THE TELZEY TOY
James H. Schmitz



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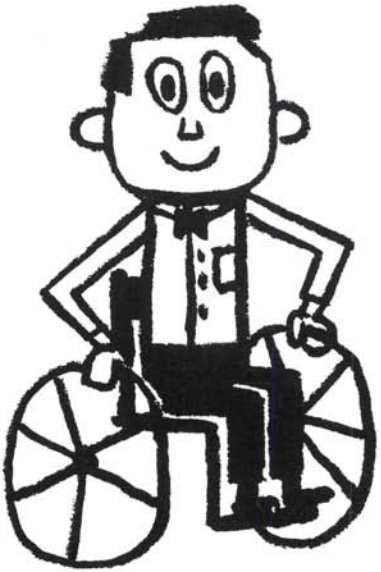

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THE BABY IN THE BATH WATER

Editorial by John W. Campbell

In any society from here to the more distant galaxies of the Coma Berenices cluster there are certain fundamental characteristics you can fairly well expect. Not guaranteed certainties of course—life in reality offers exceedingly few of those!—but high probabilities.

For instance, any intelligent species gets that way by winning the age-long competition with all the other species on the planet; intelligent species will, therefore, have a deeply bred-in competitiveness.

They rule their planet because they have a native drive toward curiosity and a consequent tendency to attack and conquer frontiers. At least some of them do—and others eventually follow.

There will be some who attack geographical frontiers, others who go after intellectual frontiers, and some who seek to expand industrial frontiers; all contribute in different ways to the growth and expansion of the race—whether they breathe oxygen, methane-ammonia-hydrogen, gaseous sulfur, or whatever may have evolved on their own planet. If they weren't frontier-crossers, they wouldn't have achieved ownership of their own planet; some other native species would have.

Another thing you'll find in any culture will be the fanatics—the individuals who have a Great Truth and seek to make all around them Accept and Believe. That can be a religious idea, a nationalistic idea ("Heil Hitler!"), an intellectual idea ("The Earth is really flat; those astronauts are simply sailing around the edge of the flat Earth-disk!") or what. Their great distinguishing characteristic, in a well-developed and firmly rooted fanaticism (". . . a well systemitized set of delusions . . .") is a tendency to throw the baby out with the hated bath water, and defend the act because, after all, that baby was contaminated with dirty bath water.

Among the more prominent of our current crop of fanatics ardently seeking to dispose of contaminated babies are the idealists who are seeking to put an end to all military-supported research. If the military is interested in supporting it, that proves it *must* be con-

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taminated, and wicked, evil, hideous, awful, perverted, immoral, unethical, and besides we don't like it.

One of the latest triumphs of these fanatics is to force the University of Illinois to suspend work on a new computer being developed under an Air Force research contract. A new special building to house the new computer had already been built—but under the pressure of campus idealist-fanatics, the University knuckled under, abandoned their project, and the computer will have to be built elsewhere. Glory! Glory! They got rid of that baby!

The effort being made was, as I understand it, a try at constructing a *conscious* computer.

At Project Mac, at MIT, the effort is to build an *intelligent* computer; note the difference carefully. (Another difference is that when the baby-disposers tried to get rid of the military-supported Project Mac at MIT, they didn't get very far. Technical students have a lower index of fanaticism, because it's so hard to sell your ideas to physical-world devices such as electrons and transistors.)

Any organism that can be rendered unconscious must, by definition, have been conscious; the organism doesn't have to have been *intelligent,* just conscious. A frog is conscious, but hardly anyone claims it is intelligent. A dog is certainly conscious, and moderately intelligent as well—but the two characteristics are distinct.

Recently the MIT Project Mac computer rather accidentally passed the "Turning Test"—a man, in teletype communication with the computer, believed he was communicating with another man on the project; he was, in fact, accidentally hooked in to Project Mac's psychological interview program. If a man can't tell whether he's talking to a computer or a fellow man—the computer's intelligent!

A *conscious* computer would be aware of what it was doing. An anesthetized dog continues to breathe, digest, regulate his temperature, maintain blood pressure. He can cough, sneeze, swallow. He's *un*-conscious if he isn't aware that he's doing these things, as he would be if he were conscious.

A conscious computer could observe what it was doing, and learn, improve its own methods of operation, develop its own programs, debug programs given to it, et cetera.

But those who Know for Sure that anything touched by the Military is Evil insist on throwing out that baby; it's got bath water on it.

Let's take a look at some of the wicked-awful-evil things military research has produced to devastate the world and mankind.

We could start almost anywhere —perhaps with Ugh, the caveman whose military research led to the

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introduction of fire as a weapon against encroaching cold, tigers, and cave bears . . . and other tribes who envied Ugh's clan's cave.

Or come up to modern times, when that militaristic researcher, Walter Reed and his cohorts conquered the problem of yellow fever. ("Throw it away! It's evil because the military budget paid for it!")

Of course sonar, which makes it possible to track fish and thus increase the food from the sea for starving peoples, is an evil thing because it was invented and developed entirely under military-industrial complex financing. Radar, essential to modern air traffic, is another contaminated development—the military developed that one, or should we say the hated military-industrial complex?

The modern bug-bomb was developed by military-industrial researchers, trying to keep the tropical insects of the South Pacific from causing more casualties than the Japs did.

DDT is now rated as an awful-evil-wicked thing itself, and is properly damned for its military-industrial origin. (It's been misused, of course—but it's nevertheless the weapon of choice against body lice, scabies, and the like. And it saved Italy from a terrible epidemic toward the end of WWII; in war-torn, devastated Italy, baths weren't quite so easy to come by as they are in modern America. DDT sprinkled into dirty clothes annihilated the lice, that famous living link in rats, lice, and history.)

Penicillin wasn't discovered by the military, of course—but how to produce the stuff in usable quantity was. The U.S. Army paid for that research; you should never allow the resulting antibiotic to be used because of its wicked, wicked origin?

Then let's see . . . the electronic computers that make modern business, science and transport workable, that control oil refineries and spaceships equally well, were originally developed under Navy financed research during the latter part of WWII.

Remember that all military-financed research is wicked, and must be stopped, and it becomes clear that the work being done on the development of mechanical heart replacements should be discontinued at once. It's being financed by the Department of Defense.

The immense gain in knowledge of how to treat massive and severe burns must be rejected also—it's contaminated with military financing.

Oh, by the way—nerve gases should not be rejected: they were a result of nonmilitary research. The chemists who discovered the critical organo-phosphorus compounds were trying to develop insecticides to reduce crop losses and had no idea what they had—until their ap-

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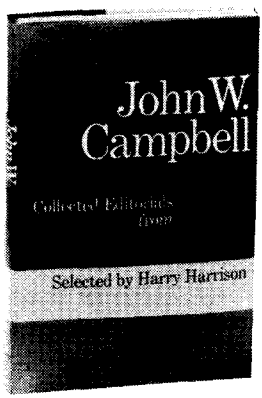

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paratus leaked. Other chemists, seeing that the men in that laboratory had dropped dead, discovered what happened. The Wehrmacht took it from there. But it was *not* a product of military research.

Any discovery that anybody makes anywhere can always be misapplied. Ugh's great discovery of fire is a favorite with vandals and psychotics.

From the days of sometime-B.C. to the Twentieth Century, there had been no essential change in prostheses. Glug, who had his leg bitten off by the cave bear in Deep Cave, hobbled around with a stick lashed to the stump—as did Nineteenth Century Cap'n Joshua (Peg-leg) Morgan who lost his to a whale. In the intervening 75,000 years, progress was somewhat slow.

Military research during and after WWII, almost entirely financed by military budgets, clearly should be rejected out of hand, because of the tainted money used. We shouldn't accept those surgical prostheses that permit a man with a shattered hip to regain full movement—the ingenious mechanical hands that allow people who have lost their left arms to hold on to things again. The *left* arm—because that's the one people drool on the windowsill of their car as they get sideswiped by another car. (Most of the American people who

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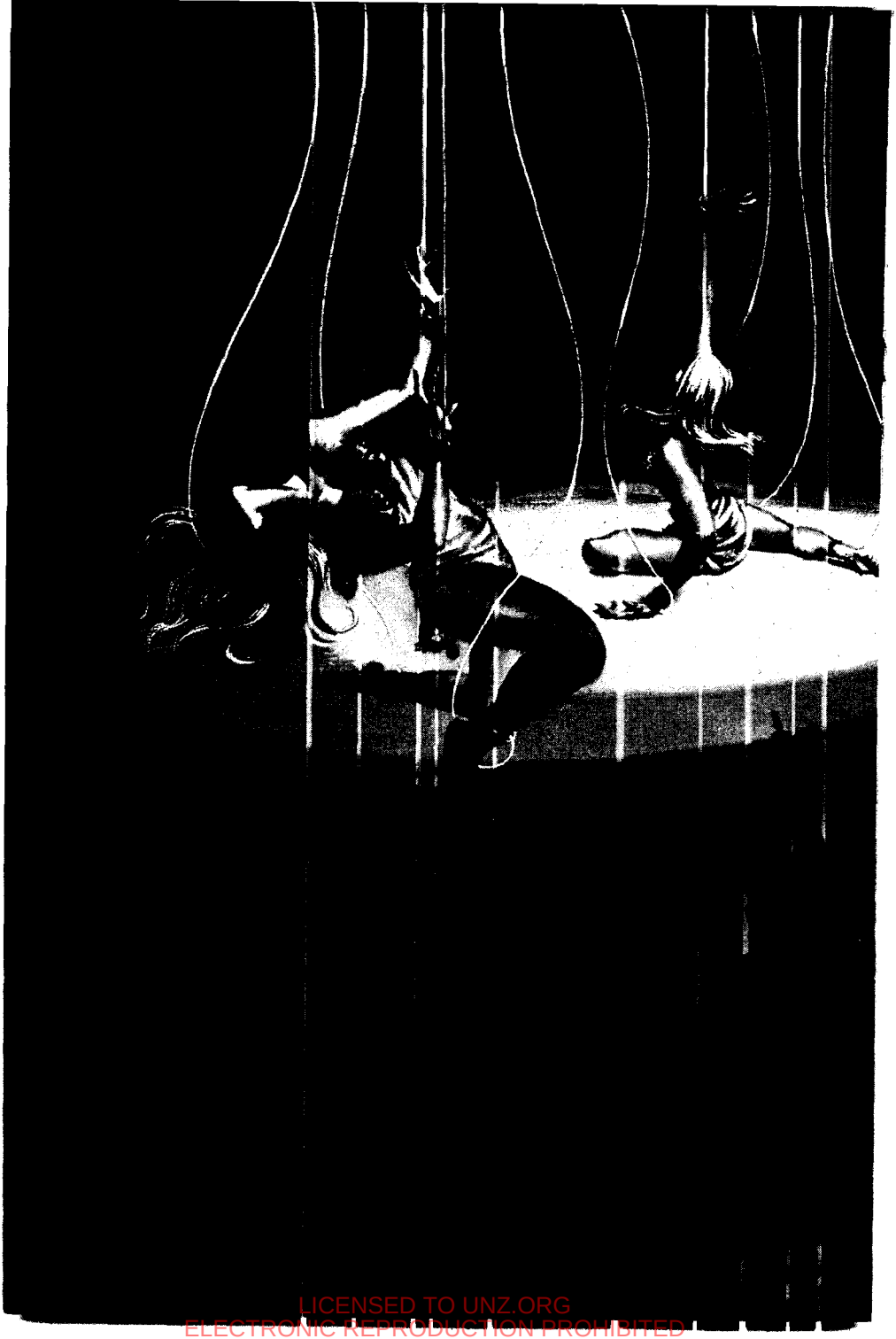

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THE TELZEY TOY

It wasn't so much that I love
bit off more than
somebody should

JAMES H. SCHMITZ

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I

An auburn-haired, petal-cheeked young woman who belonged in another reality came walking with feline grace along a restaurant terrace in Orado City where Telzey had stopped for lunch during a shopping excursion.

Telzey watched her approach. This, she decided, was quite strange. Going by her appearance and way of moving, the woman seemed to be someone she'd met before. But she knew they hadn't met before. She knew also, in a curiously definite manner, that the woman simply couldn't be on this terrace in Orado City. She existed in other dimensions, not here, not now.

The woman who didn't exist here glanced at Telzey in passing. There was no recognition in the look. Telzey shifted her chair slightly, watched the familiar-unfamiliar phantom take another table not far away, pick up an order disk. A very good-looking young woman with a smooth unsmiling face, fashionably and expensively dressed—and nobody else around seemed to find anything at all unreasonable in her presence.

So perhaps, Telzey reflected, it was her psi senses that found it unreasonable. She slipped out a thought probe, held it a moment. It produced no telepathic touch response, no suggestion of shielding. If the woman was psi, she was an atypical variety. She'd taken a snack glass from the table dispenser by now, was sipping at it—

Comprehension came suddenly. No mystery after all, Telzey told herself, half amused, half disappointed. A year ago, she'd gone with some acquaintances to take in a Martridrama. The woman looked and walked exactly like one of the puppets they'd seen that evening, one who played a minor role but appeared enough of an individual to have left an impression in memory. No wonder it had seemed a slightly uncanny encounter—Martri puppets didn't go strolling around the city by themselves!

Another thought drifted up then, quite idly.

Or did they?

Telzey studied the pale profile again. Her skin began prickling. It was a most improbable notion, but there might be a quick way of checking it. Some minds could be tapped easily, some with varying degrees of difficulty, some not at all. If this woman happened to be one of the easy ones, a few minutes of probing should establish what she was—or wasn't.

It took longer than that. Telzey had contact presently, but it remained tenuous and indistinct; she lost it repeatedly. Then, as she reestablished it again, a little more definitely now, the woman finished her snack drink and stood up. Telzey slipped a pay chit for her lunch into the table's receptacle, waited

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till her quarry turned away, then followed her toward a terrace exit.

A Martri puppet was a biological organism superficially indistinguishable from a human being. It had a brain which could be programmed, and which responded to cues with human speech and human behavior. Whether something resembling the human mind could be associated with that kind of brain was a point Telzey hadn't found occasion to consider before. She was no Martriphile, didn't, in fact, particularly care for that form of entertainment.

There was mind here, and the blurred patterns she'd touched seemed human. But she hadn't picked up enough to say it couldn't be the mind of a Martri puppet . . .

The woman took an airtaxi on another terrace of the shopping complex. As it rose from the platform, Telzey got into the next taxi in line and told the driver to follow the one that had just left. The driver spun his colleague's car into his screen.

"Don't know if I can," he said then. "He's heading up into heavy traffic."

Telzey smiled at him. "Double fare for trying!"

They set off promptly in pursuit. Telzey clung to her contact, began assembling additional data. Some minutes later, the driver announced, "Looks like we've lost them!"

She already knew it. Distance wasn't necessarily a factor in developing mind contact. In this case it had been a factor. The crosstown traffic stream was dense, close to the automatic reroute point. The impressions she'd been receiving, weak at best, had begun to be flooded out increasingly by intruding impressions from other minds. The car they'd been pursuing must be several miles away by now. She let contact fade, told the driver to return to the shopping complex, and settled back very thoughtfully in her seat.

Few Martriphiles saw anything objectionable in having puppets killed literally on stage when a drama called for it. It was an essential part of Martri realism. The puppets were biological machines; the emotions and reactions they displayed were programmed ones. They had no self-awareness—that was the theory.

What she'd found in the mind of the auburn-haired woman seemed less important than what she hadn't found there, though she'd been specifically searching for it.

That woman knew where she was, what she was doing. There'd been scraps of recent memory, some moment to moment observations, an intimation of underlying purpose. But she appeared to have no personal sense of herself. She knew she existed—an objective fact

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among other facts, with no more significance than the others.

In other words, she *did* seem to lack self-awareness. As far as Telzey had been able to make out, the term had no meaning for her. But the contact hadn't been solid enough, or extensive enough, to prove it.

On the face of it, Telzey was telling herself an hour later, the thing was preposterous. She'd had a wild notion, had tried to disprove it and failed. She'd even turned up some evidence which might seem to favor the notion. It remained wild. Why waste more time on it?

She bit her thumb irritably, dialed an information center for data on Martridramas and Martri puppets, went over the material when it arrived. There wasn't much there she didn't already know in a general way. A Martri stage was a programmed computer which in turn programmed the puppets, and directed them during a play under the general guidance of the dramateer. While a play was new, no two renditions of it were exactly the same. Computer and puppets retained some choice of action, directed always toward greater consistency, logic and effect. Only when further improvement was no longer possible did a Martridrama remain frozen and glittering—a thing become perfect of its kind. It explained the continuing devotion of Martriphiles.

It didn't suggest that such a thing as a runaway puppet was a possibility.

The Martri unit which had put on the play she had seen was no longer on Orado. She could find out where it was at present, but there should be simpler ways of determining what she wanted to know immediately. A name had turned up repeatedly in her study of the Martri material . . . Wakote Ti. He was locally available. A big man: Multilevel scientist, industrial tycoon, millionaire, philanthropist, philosopher, artist and art collector; above all, a Martri specialist of specialists. Wakote Ti designed, grew and merchandised the finest puppets in the Hub, built and programmed the most advanced Martri stages, had written over fifty of the most popular plays, and was a noted amateur dramateer.

A Martriphile relative of one of Telzey's friends turned out to be an admirer and business associate of Wakote Ti. He agreed to let Telzey know the next time the great man appeared at his laboratories in Draise, and to arrange for an interview with him.

"The legality of killing a puppet is regarded as unarguable," said Wakote Ti. A college paper she'd been preparing on the legal niceties involved in the practice had been Telzey's ostensible reason for requesting the interview. He shrugged. "But I simply couldn't bring my-

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self to do it! They have life and a mentality, however limited and artificial it may be. Most importantly, they have personality, character. It's been programmed into them, of course, but, to my feeling, the distinction between puppets and humanity is one of degree rather than kind. They're unfinished people. They act always in accordance with their character, not necessarily in accordance with the wishes of the composer or dramateer. I've been surprised many times by the twists they've given the roles I assigned to them. Always valid ones! They can't be forced to deviate from what they are. In that respect they seem more honest than many of us."

Ti gave Telzey an engaging smile. He was a large, strongly muscled man, middle-aged, with a ruddy complexion and grizzled black hair. There was an air of controlled energy about him; and boundless energy he must have, to accomplish as much as he did. There was also an odd gentleness in gesture and voice. It was very easy to like Ti.

And he had a mind that couldn't be touched by a telepath. Telzey had known that after the first few minutes—probe immune. Too bad! She'd sooner have drawn the information she wanted from him without giving him any inkling of what she was after.

"Do you use real people as models for them?" Telzey asked. "I mean when they're being designed?"

"Physically?"

"Yes."

Ti shook his head. "Not any one person. Many. They're ideal types."

Telzey hesitated, said, "I had an odd experience a while ago. I saw a woman who looked so exactly like a Martri puppet I'd seen in a play, I almost convinced myself it was the puppet who'd somehow walked off the stage and got lost in the world outside. I suppose that would be impossible?"

Ti laughed. "Oh, quite!"

"What makes it impossible?"

"Their limitations. A puppet can be programmed to perform satisfactorily in somewhere between twenty and thirty-five plays. One of ours, which is currently in commercial use, can handle forty-two roles of average complexity. I believe that's the record.

"At best, that's a very limited number of specific situations as compared with the endlessly shifting variety of situations in the real world. If a puppet were turned loose there, the input stream would very quickly overwhelm its response capacity, and it would simply stop operating."

"Theoretically," said Telzey, "couldn't the response capacity be pushed up to the point where a puppet could act like a person?"

"I can't say it's theoretically impossible," Ti said, "but it would require a new technology." He smiled. "And since there are quite

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enough real people around, there wouldn't be much point to it, would there?"

She shook her head. "Perhaps not."

"We're constantly experimenting, of course." Ti stood up. "There are a number of advanced models in various stages of development in another part of the building. They aren't usually shown to visitors, but if you'd like to see them, I'll make an exception."

"I'd very much like to!" Telzey said.

She decided she wasn't really convinced. New technologies were being developed regularly in other fields—why not in that of Martri puppetry? In any case, she might be able to settle the basic question now. She could try tapping the mind of one, or the other, of the advanced models he'd be showing her, and see how what she found compared with the patterns she'd traced in the mystery woman.

That plan was promptly discarded again. Ti had opened the door to a large office, and a big-boned young man sitting there at a desk looked up at her as they came in.

He was a telepath.

The chance meeting of two telepathic psis normally followed a standard etiquette. If neither was interested in developing the encounter, they gave no sign of knowing the other was a psi. If one was interested, he produced a mental identification. If the other failed to respond, the matter was dropped.

Neither Telzey nor the young man identified themselves. Ti, however, introduced them. "This is Linden, my secretary and assistant," he said; and to Linden, "This is Telzey Amberdon, who's interested in our puppets. I'm letting her see what we have in the vaults at present."

Linden, who had come to his feet, bowed and said, "You'd like me to show Miss Amberdon around?"

"No, I'll do that," said Ti. "I'm telling you so you'll know where I am."

That killed the notion of probing one of the puppets in the vaults. Now they'd met, it was too likely that Linden would become aware of any telepathic activity in the vicinity. Until she knew more, she didn't want to give any hint of her real interest in the puppets. There were other approaches she could use.

The half hour she spent in the vaults with Ti was otherwise informative. "This one," he said, "is part of an experiment designed to increase our production speed. Three weeks is still regarded as a quite respectable time in which to turn out a finished puppet. We've been able to do a good deal better than that for some while. With these models, starting from scratch and using new hypergrowth proc-

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esses, we can produce a puppet programmed for fifteen plays in twenty-four hours." He beamed down at Telzey. "Of course, it's probably still faulty—it hasn't been fully tested yet. But we're on the way! Speed's sometimes important. Key puppets get damaged, or destroyed, and most of some Martri unit's schedule may be held up until a replacement can be provided."

That night at her home in Orado City, Telzey had an uninvited visitor. She was half asleep when she sensed a cautious mental probe. It brought her instantly and completely awake, but she gave no immediate indication of having noticed anything. It mightn't be a deliberate intrusion.

However, it appeared then that it was quite deliberate. The other psi remained cautious. But the probing continued, a not too expert testing of the density of her screens, a search for a weakness in their patterns through which the mind behind them might be scanned or invaded.

Telzey decided presently she'd waited long enough. She loosened her screens abruptly, sent a psi bolt flashing back along the line of probe. It smacked into another screen. The probe vanished. Somebody somewhere probably had been knocked cold for an hour.

Telzey lay awake a while, reflecting. She'd had a momentary impression of the personality of the prowler. Linden? It might have been. If so, what had he been after?

No immediate answer to that.

II

There was a permanent Martri stage in Orado City, and Telzey had intended taking in a show there next day—a Martridrama looked like the best opportunity now to get in some discreet study on puppet minds. Her experience with the psi prowler made her decide on a shift in plans. If it had been Wakote Ti's secretary who'd tried to probe her, then it could be that Ti had some reason to be interested in a telepath who was interested in Martri puppets, and her activities might be coming under observation for a while. Hence she should make anything she did in connection with the puppets as difficult to observe as she could—which included keeping away from the Orado City stage.

She made some ComWeb inquiries, arrived presently by pop transport shuttle in a town across the continent, where a Martridrama was in progress. She'd changed shuttles several times on the way. There'd been nothing to indicate she was being followed.

She bought a ticket at the stage, started up a hall toward the auditorium entry—

She was lying on her back on a

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couch, in a large room filled with warm sunshine. There was no one else in the room.

Shock held her immobilized for a moment.

It wasn't only that she didn't know where she was, or how she'd got there. Something about *her* seemed different, changed, profoundly wrong.

Realization came abruptly—every trace of psi sense was gone. She tried to reach out mentally into her surroundings, and it was like opening her eyes and still seeing nothing. Panic began to surge up in her then. She lay quiet, holding it off, until her breathing steadied again. Then she sat up on the couch, took inventory of what she could see here. The upper two-thirds of one side of the room was a single great window open on the world outside. Tree crowns were visible beyond it. Behind the trees, a mountain peak reached toward a blue sky. The room was simply furnished with a long table of polished dark wood, some chairs, the low couch on which she sat. The floor was carpeted. Two closed doors were in the wall across from the window.

Her clothes—white shirt, white shorts, white stockings and moccasins—weren't the ones she'd been wearing.

None of that told her much, but meanwhile the threat of panic had withdrawn. She swung around, slid her legs over the edge of the couch. As she stood up, one of the doors opened, and Telzey watched herself walk into the room.

It jolted her again, but less severely. Take another girl of a size and bone structure close enough to her own, and a facsimile skin, eye tints, a few other touches, could produce an apparent duplicate. There'd be differences, but too minor to be noticeable. She didn't detect any immediately. The girl was dressed exactly as she was, wore her hair as she wore hers.

"Hello," Telzey said, as evenly as she could. "What's this game about?"

Her double came up, watching her soberly, stopped a few feet away. "What's the last thing you remember before you woke up here?" she asked.

Her voice, too? Quite close to it, at any rate. Telzey said guardedly, "Something like a flash of white light inside my head."

The girl nodded. "In Sombedaln."

"In Sombedaln. I was in a hall, going toward a door."

"You were about thirty feet from that door," said her double. "And behind it was the Martri auditorium. . . . Those are the last things I remember, too. What about psi? Has it been wiped out?"

Telzey studied her a moment. "Who are you?" she asked.

The double shrugged. "I don't know. I feel I'm Telzey Amberdon. But if I weren't, I might still feel that."

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"If you're Telzey, who am I?" Telzey said.

"Let's sit down," the double said. "I've been awake half an hour, and I've been told a few things. They hit me pretty hard. They'll probably hit you pretty hard."

They sat down on the edge of the couch. The double went on. "There's no way we could prove right now that I'm the real Telzey. But there might be a way we can prove that you are, and I'm not."

"How?"

"Psi," said the double. "Telzey used it. I can't use it now. I can't touch it. Nothing happens. If you—"

"I can't either," Telzey said.

The double drew a sighing breath.

"Then we don't know," she said. "What I've been told is that one of us is Telzey and the other is a Martri copy who thinks she's Telzey. A puppet called Gaziel. It was grown during the last two days like other puppets are grown, but it was engineered to turn into an exact duplicate of Telzey as she is now. It has her memories. It has her personality. They were programmed into it. So it feels it's Telzey."

Telzey said, after some seconds, "Ti?"

"Yes. There's probably no one else around who could have done it."

"No, I guess not. Why did he do it?"

"He said he'd tell us that at lunch. He was still talking to me when he saw in a screen that you'd come awake, and sent me down here to tell you what had happened."

"So he's been watching?" Telzey said.

The double nodded. "He wanted to observe your reactions."

"As to which of you is Telzey," said Ti, "and which is Gaziel, that's something I don't intend to let you know for a while!" He smiled engagingly across the lunch table at them. "Theoretically, of course, it would be quite possible that you're both puppets and that the original Telzey is somebody else. However, we want to have some temporary way of identifying you two as individuals."

He pulled a ring from his finger, put both hands under the table level, brought them to view again as fists. "You," he said to Telzey, "will guess which hand is holding the ring. If you guess correctly, you'll be referred to as Telzey for the time being, and you," he added to the double, "as Gaziel. Agreed?"

They nodded. "Left," Telzey said.

"Left it is!" said Ti, beaming at her, as he opened his hand and revealed the ring. He put it back on his finger, inquired of Linden, who made a fourth at the table, "Do you think she might have cheated by using psi?"

Linden glowered, said nothing.

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Ti laughed. "Linden isn't fond of Telzey at present," he remarked. "Did you know you knocked him out for almost two hours when he tried to investigate your mind?"

"I thought that might have happened," said Gaziel.

"He'd like to make you pay for it," said Ti. "So watch yourselves, little dears, or I may tell him to go ahead. Now as to your future—Telzey's absence hasn't been discovered yet. When it is, a well-laid trail will lead off Orado somewhere else, and it will seem she's disappeared there under circumstances suggesting she's no longer alive. I intend, you see, to keep her indefinitely."

"Why?" Telzey asked.

"She noticed something," said Ti. "It wouldn't have seemed too important if Linden hadn't found out she was a telepath."

"Then that *was* your puppet I saw?" Gaziel said. She glanced over at Telzey, added, "That one of us—Telzey—saw."

"That *we* saw," Telzey said. "That will be simplest for now."

Ti smiled. "You live up to my expectations! . . . Yes, it was my puppet. We needn't go further into that matter at present. As a telepath and with her curiosities aroused, Telzey might have become a serious problem, and I decided at once to collect her rather than follow the simpler route of having her eliminated. I had her background checked out, which confirmed the favorable opinions I'd formed during our discussion. She should make a most satisfactory subject. Within the past hour, she's revealed another very valuable quality."

"What's that?" Telzey said.

"Stability," Ti told her. "For some time, I've been interested in psis in my work, and with Linden's help I've been able to secure several of them before this." He shook his head. "They were generally poor material. Some couldn't even sustain the effect of realizing I had created an exact duplicate of them. They collapsed into uselessness. So, of course, did the duplicates. But look at you two! You adjusted immediately to the situation, have eaten with every indication of a good appetite, and are no doubt already preparing schemes to get away from old Ti."

Telzey said, "Just what is the situation? What are you planning to do with us?"

Ti smiled at her. "That will develop presently. There's no hurry about it."

"Another question," said Gaziel. "What difference does it make that Telzey's a psi when you've knocked out her psi ability?"

"Oh, that's not an irreversible condition," Ti informed her. "The ability will return. It's necessary to keep it repressed until I've learned how to harness it, so to speak."

"It will show up in the duplicate, too, not just in the original?" Gaziel asked.

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Ti gave her an approving look. "Precisely one of the points I wish to establish! My puppets go out on various errands for me. Consider how valuable puppet agents with Telzey's psi talent could be—a rather formidable talent, as Linden here can attest!"

He pushed himself back from the table. "I've enjoyed your questions, but I have work to take care of now. For the moment, this must be enough. Stroll about and look over your new surroundings. You're on my private island. Two-thirds of it is an almost untouched wilderness. The remaining third is a cultivated estate, walled off from the forest beyond. You're restricted to the estate. If you tried to escape into the forest, you'd be recaptured. There are penalties for disobedience, but more importantly, the forest is the habitat of puppet extravaganzas—experimental fancies you wouldn't care to encounter! You're free to go where you like on the estate. The places I wouldn't wish you to investigate at present are outside your reach."

"They have some way of knowing which of us is which, of course," Gaziel remarked from behind Telzey. They were threading their way through tall flowering shrubbery on the estate grounds.

"It would be a waste of time trying to find out what it is, though," Telzey said.

Gaziel agreed. The Martri duplicate might be marked in a number of ways detectable by instruments but not by human senses. "Would it disturb you very much if it turned out you weren't the original?" she said.

Telzey glanced back at her. "I'm sure it would," she said soberly. "You?"

Gaziel nodded. "I haven't thought about it too much, but it seems there's always been the feeling that I'm part of something that's been there a long, long time. It wouldn't be at all good to find out now that it was a false feeling—that I was only myself, with nothing behind me."

"And somebody who wasn't even there in any form a short while ago," Telzey added. "It couldn't help being disturbing! But that's what one of us is going to find out eventually. And, as Ti mentioned, we may both be duplicates. You know, our minds do seem to work identically—almost."

"Almost," said Gaziel. "They must have started becoming different minds as soon as we woke up. But it should be a while before the differences become too significant."

"That's something to remember," Telzey said.

They emerged from the flower thicket, saw the mountain again in the distance, looming above the trees. It rose at the far tip of the island, in the forest area. The cultivated estate seemed to cover a great deal of ground. When they'd

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started out from a side door of the round gleaming-white building which stood approximately at its center, they couldn't see to the ends of it anywhere because groups of trees blocked the view in all directions. But they could see the mountain and had started off toward it.

If they kept on toward it, they would reach the wall which bordered the estate—

"There's one thing," Telzey said. "We can't ever be sure here whether Ti or somebody else isn't listening to what we say."

Gaziel nodded. "We'll have to take a chance on that."

"Right," Telzey said. "We wouldn't get very far if we stuck to sign language or counting on thinking the same way about everything."

They came to the estate wall ten minutes later. It was a wall designed to discourage, at first glance, any notions of climbing over it. Made of the same gleaming material as the central building, its smooth unbroken surface stretched up a good thirty-five feet above the ground. It curved away out of sight behind trees in either direction; but none of the trees they saw stood within a hundred feet of the wall. They turned left along it. Either there was a gate somewhere, or aircars were used to reach the forest.

They came to a gateway presently. Faint vehicle tracks in the grass led up to it from various directions. It was closed by a slab set into the wall, which appeared to be a sliding door. They could find no indication of a lock or other mechanism.

"Might be operated from the house."

It might be. In any case, the gateway seemed to be in regular use. They sat down on the grass some distance away to wait. And they'd hardly settled themselves when the door slab drew silently back into the wall. A small enclosed ground vehicle came through; and the slab sealed the gateway again. The vehicle moved on a few yards, stopped. They hadn't been able to see who was inside, but now a small door opened near the front end. Linden stepped out and started toward them, scowling. They got warily to their feet.

"What are you doing here?" he asked as he came up.

"Looking around generally like Ti told us to," said Gaziel.

"He didn't tell you to sit here watching the gate, did he?"

"No," Telzey said. "But he didn't say not to."

"Well, I'm telling you not to," Linden said. "Move on! Don't let me find you around here again."

They moved on. When they glanced back presently, the vehicle had disappeared.

"That man really doesn't like us," Gaziel remarked thoughtfully.

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"No, he doesn't," Telzey said. "Let's climb a tree and have a look at the forest."

They picked a suitable tree, went up it until they were above the level of the wall and could see beyond it. A paved road wound away from the area of the gate toward the mountain. That part of the island seemed to be almost covered with a dense stand of tropical trees; but, as on this side, no trees grew very close to the wall. They noticed no signs of animal life except for a few small fliers. Nor of what might be Ti's experimental Martri life.

Telzey said, "The gate controls are probably inside the cars they use when they go out there."

"Uh-huh—and the car Linden was in was armored." Gaziel had turned to study the surrounding stretches of the estate from their vantage point. "Look over there!"

Telzey looked. "Gardening squad," she said after a moment. "Maybe we can find out something from them."

III

A flotilla of sixteen flat machines was gliding about purposefully a few inches above the lawns among the trees. An operator sat on each, manipulating controls. Two men on foot spoke now and then into communicators, evidently directing the work.

Gaziel nodded. "Watch that one!"

They'd approached with some caution, keeping behind trees for the most part, and hadn't yet been observed. But now one of the machines was coming in directly from the side toward the tree behind which they stood. The operator should be able to see them, but he was paying them no attention.

They studied him in uneasy speculation. There was nothing wrong about his motions; it was his expression. The eyes shifted around, but everything else seemed limply dead. The jaw hung half open; the lips drooped; the cheeks sagged. The machine came up almost to the tree, turned at a right angle, started off on another course.

Telzey said softly, "The other operators seem to be in about the same condition—whatever it is. But the supervisors look all right. Let's see if they'll talk."

They stepped out from behind the tree, started toward the closer of the two men on foot. He caught sight of them, whistled to draw his companion's attention.

"Well," he said, grinning amiably as they came up. "Dr. Ti's new guests, aren't you?" His gaze shifted between them. "And, uh, twin. Which is the human one?"

The other man, a big broad-shouldered fellow, joined them. Telzey shrugged. "We don't know."

The men stared. "Can't you tell?" the big one demanded.

"No," said Gaziel. "We both feel we're human." She added, "From

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what Dr. Ti told us, you mightn't be real people either and you wouldn't know it."

The two looked at each other and laughed.

"Not likely!" the big man said. "A wirehead doesn't have a bank account."

"You do? Outside?" Gaziel said.

"Uh-huh. A healthy one. My name's Remiol, by the way. The little runt's Eshan."

"We're Telzey and Gaziel," said Telzey. "And maybe you could make those bank accounts a lot healthier."

They looked at her, then shook their heads decidedly.

"We're not helping you get away, if that's what you mean," Remiol said. Eshan added, "There'd be no way of doing it if he wanted to. You kids just forget about that and settle down! This isn't a bad place if you keep out of trouble."

"You wouldn't have to help us get away exactly," Telzey said. "How often do you go to the mainland?"

There was a sudden momentary vagueness in their expressions which made her skin prickle.

"Well," Remiol said, frowning and speaking slowly as if he had some difficulty finding the words, "about as often as we feel like it, I'd say. I . . ." He hesitated, gave Eshan a puzzled look.

"You could take out a message," Gaziel said, watching him.

"Forget it!" said Eshan, who seemed unaware of anything unusual in Remiol's behavior. "We work for Dr. Ti. The pay's great and the life's easy. We aren't going to spoil that setup!"

"All right," Telzey said after a moment. "If you don't want to help us, maybe you won't mind telling us what the setup is."

"Wouldn't mind at all!" said Remiol, appearing to return abruptly to normal. He gave Telzey a friendly grin. "If Dr. Ti didn't want us to talk to you, we'd have been told. He's a good boss—you know where you are with him. Eshan, give the wireheads a food break and let's sit down with the girls."

They sat down in the grass together. Gaziel indicated the machine operators with a hand motion. "You call them wireheads. They aren't humans but a sort of Martri work robot?"

"Not work robots," Remiol said. "Dr. Ti doesn't bother with those. These are regular puppets—maybe defectives, or some experiment, or just drama puppets who've played a few roles too many. When they get like this, they don't last more'n a year—then back they go to the stuff they grow them from. Meanwhile they're still plenty good for this kind of work."

"Might be a few real humans among them," Eshan said reflectively, looking over at the oper-

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ators. "After a while, you don't think about it much—they're all programmed anyway."

"How do real humans get to be in that kind of shape?" Gaziel said.

The men shrugged. "Some experiment again," said Remiol. "A lot of important research going on in the big building here."

Telzey said, "How did you know one of us was a wirehead?"

"One of the lab workers told us," said Eshan. "She said Dr. Ti was mighty happy with the results. Some of his other twinning projects hadn't turned out so well."

Remiol winked at Telzey. "This one turned out perfect!"

She smiled. "You ever been on the other side of the wall?"

They had. Evidently, it was as unhealthy as Ti had indicated to go there unless one was in one of the small fleet of armored and armed vehicles designed for the purpose. The only really safe place on the forest side was a small control fort on the slope of the mountain, and that came under occasional attack. Eshan and Remiol described some of the Martri creations they'd seen.

"Why does Dr. Ti keep them around?" Gaziel asked.

"Uses them sometimes in the Martridramas he puts on here," said Remiol.

"And wait till you've seen one of those!" said Eshan. "That's real excitement! You don't see shows like that anywhere else."

"Otherwise," Remiol said, speaking of the forest puppets, "I guess it's research again. I worried at first about one of them coming over the wall. But it's never happened."

"Well, well!" said Ti. "Having a friendly gossip?"

He'd come floating out of a grove of trees on a hoverdisk and stopped a few feet away, holding the guide rail in his large hands.

"Hope you don't mind, Doctor," Remiol said. He and Eshan had got to their feet as Ti approached.

Ti smiled. "Mind? Not in the least. I'm greatly pleased that the new members of our little community have begun to make acquaintances so quickly. However, now we'll all be getting back to work, eh? Telzey and Gaziel, you can stand up here with me and we'll return to the house together."

They stepped up on the disk beside him, and it swung gently around and floated away, while the gardening machines lifted from the ground and began to reform into their interrupted work patterns.

"Fine fellows, those two!" said Ti, beaming down at Gaziel and Telzey. "They don't believe in overexerting themselves, of course. But then that isn't necessary here, and I prefer a relaxed and agreeable atmosphere around me."

Telzey said, "I understand it's sometimes rather exciting, too."

Ti chuckled. "That provides the counterpoint—the mental and emo-

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tional stimulus of the Martridrama! I need both. I'm always at my best here on the island! A room has been prepared for you two. You'll be shown there, and I'll come shortly to introduce you to some of the more interesting sections of our establishment."

The groundcar Linden had been operating stood near the side door Telzey and Gaziel had used when they left the building. The hoverdisk went gliding past it to the door which opened as they approached, and into the building. In the hall beyond, it settled to the floor. They stepped down from it.

"Why, Challis!" said Ti heartily, gazing past Telzey. "What a pleasant surprise to see you back!"

Telzey and Gaziel looked around. A pale slender woman with light-blue hair was coming across the hall toward them.

"This is my dear wife," Ti told them. He was smiling, but it seemed to Telzey that his face had lost some of its ruddy color. "She's been absent from the island for some time. I didn't know she was returning . . ." He turned to Challis as she came up. "These are two very promising recruits, Challis. You'll be interested in hearing about my plans for them."

Challis looked over at them with an expression which was neither friendly nor unfriendly. It might have been speculative. She had pale-gray eyes and delicately beautiful features. She nodded slightly; and something stirred eerily in Telzey's mind.

Ti said, "I'll send someone to show you two to your room." He took Challis by the arm. "Come, my dear! I must hear what you've been doing."

He went off toward a door leading from the hall, Challis moving with supple ease beside him. As the door closed on the pair, Telzey glanced at Gaziel.

Gaziel said blandly, "You know, Ti's wife reminds me of someone. But I simply can't remember who it is."

So she'd noticed it, too—the general similarity in appearance and motion between Challis and the auburn-haired puppet who'd come walking along the restaurant terrace in Orado City . . .

A brisk elderly woman appeared a few minutes later. She led them to a sizable room two building levels above the hall, showed them what it contained, including a wardrobe filled with clothing made to their measurements, and departed after telling them to get dressed and wait here for Dr. Ti.

They selected other clothes, put them on. They were the sort of thing Telzey might have bought for herself and evidently had been chosen with considerable care. They opened the door then and looked out. No one was in sight. They went quickly and quietly back downstairs to the entrance hall.

Linden's armored car still stood

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where they had seen it. There was no one in sight here either. They went over to the car. It took only a moment to establish that its two doors were locked, and that the locks were of the mechanical type.

They returned hurriedly to their room.

IV

"Here," said Ti, "you see my current pool of human research material."

They were on an underground level of the central building, though the appearance of the area didn't suggest it. It was a large garden, enclosed by five-story building fronts. Above was a milky skylight. Approximately a hundred people were in sight in the garden and on the building galleries. Most of them were young adults. There were few children, fewer of the middle-aged, no oldsters at all. They were well-dressed, well-groomed; their faces were placid. They sat, stood, moved unhurriedly about, singly and in groups. Some talked; some were silent. The voices were low, the gestures leisurely.

"They're controlled by your Martri computer?" Telzey asked.

Ti nodded. "They've all been programmed, though to widely varying degrees. Since they're not being used at the moment, what you see is a random phase of the standard nonsleeping activity of each of them. But notice the group of five at the fountain! They've cued one another again into the identical discussion they've had possibly a thousand times before. We can vary the activity, of course, or reprogram a subject completely. I may put a few of them through their paces for you a little later."

"What's the purpose of doing this to them?" said Gaziel.

Ti said, "These are converging lines of study. On the one hand, as you're aware, I'm trying to see how close I can come to turning a Martri puppet into a fully functioning human being. On the other hand, I'm trying to complete the process of turning a human being into a Martri puppet, or into an entity that is indistinguishable from one. The same thing, of course, could be attempted at less highly evolved life levels. But using the human species is more interesting and has definite advantages—quite aside from the one that it's around in abundance, so there's no problem of picking up as much research material as I need, or of the type I happen to want."

"Aren't you afraid of getting caught?" Gaziel said.

Ti smiled. "No. I'm quite careful. Every day, an amazing number of people in the Hub disappear, for many reasons. My private depredations don't affect the overall statistics."

Telzey said, "And after you've done it—after you've proved you can turn people into puppets and

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puppets into people—what are you going to do?"

Ti patted her shoulder. "That, my dear, needn't concern you at present. However, I do have some very interesting plans."

Gaziel looked up at him. "Is this where the one of us who's the original Telzey will go?"

"No," Ti said. "By no means. To consign her to the research pool would be inexcusably wasteful. Telzey, if matters work out satisfactorily, will become my assistant."

"In what way?"

"That woman puppet you were so curious about—you tried to investigate its mind, didn't you?"

Gaziel hesitated an instant. "Yes."

"What did you find?"

"Not too much. It got away from me too quickly. But it seemed to me that it had no sense of personal existence. It was there. But it was a nothing that did things."

"Did you learn what it was doing?"

"No."

Ti rubbed his jaw. "I'm not sure I believe that," he remarked thoughtfully. "But it makes no difference now. I have a number of such puppet agents. Obviously, a puppet which is to be employed in that manner should never be developed from one of the types that are in public dramatic use. That it happened in this case was a serious error; and the error was Linden's. I was very much annoyed with him. However, your ability to look into its mind is a demonstration of Telzey's potential value. Linden, as far as I can judge the matter, is a fairly capable telepath. But puppet minds are an almost complete blur to him, and when it comes to investigating human minds in the minute detail I would often prefer, he hasn't been too satisfactory. Aside from that, of course, he has many other time-absorbing duties.

"We already know that Telzey is a more capable telepath than Linden in at least two respects. When her psi functions have been restored, she should become extremely useful." Ti waved his hand about. "Consider these people! The degree of individual awareness they retain varies, depending on the extent and depth of the programming they've undergone. In some, it's not difficult to discern. In others, it's become almost impossible by present methods. That would be one of Telzey's tasks. She should find the work interesting enough."

"She'll be a wirehead?" Telzey said.

"Oh, yes, you'll both be programmed," Ti told her. "I could hardly count on your full collaboration otherwise, could I? But it'll be delicate work. Our previous experiments have indicated that programming psi minds presents special difficulties in any case, and I want to be quite sure that nothing goes wrong here. Your self-aware-

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ness shouldn't be affected for one thing." He smiled. "I believe I've come close to solving those problems. We'll see presently."

Telzey said, "What do you have in mind for the one who isn't Telzey?"

"Ah! Gaziel!" Ti's eyes sparkled. "I'm fascinated by the possibilities there! The question is whether our duplication processes have brought on the duplication of the original psi potential. There was no way of testing indirectly for that, but we should soon know. If they have, Gaziel will have become the first Martri psi. In any case, my dears, you can rest assured, whichever you may be, that each of you is as valued by me as the other and will be as carefully handled. I realize that you aren't reconciled to the situation, but that will come in time."

Telzey looked at him. Part lies, part truth. He'd handle them carefully, all right. Very carefully. They had value. And he'd weave, if they couldn't prevent it, a tightening net of compulsions about them they'd never escape undestroyed. What self-awareness they'd have left finally might be on the level of that of his gardening supervisors . . .

"Eshan and Remiol are wireheads, too, aren't they?" she said.

Ti nodded. "Aside from Linden and myself and at present you two, everyone on the island is—to use that loose expression—a wirehead. I have over a hundred and fifty human employees here, and, like the two with whom you spoke, they're all loyal, contented people."

"But they don't have big bank accounts outside and aren't allowed off the island by themselves?" Telzey said.

Ti's eyebrows lifted.

"Certainly not!" he said. "Those are pleasant illusions they maintain. There are too many sharp inquiring minds out there to risk arrangements like that. Besides, while I have a great deal of money, I also have a great many uses for it. Why should I go to unnecessary expense?"

"We didn't really think you had," Gaziel said.

"And now," said Ti, stopping before a small door, "you are about to enjoy a privilege granted to none other of our employees! Behind this door is the brain and nerve center of Ti's Island—the Dramateer Room of the Martri computer." He took out two keys, held their tips to two points on the door's surface. After a moment, the keys sank slowly into the door. Ti twisted them in turn, withdrew them. The door—a thick ponderous door—swung slowly into the room beyond. Ti motioned Telzey and Gaziel inside, followed them through.

"We're now within the computer," he said, "and this room, like the entire section, is heavily

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shielded. Not that we expect trouble. Only Linden and I have access here. No one else even knows where the Dramateer Room is. As my assistants-to-be, however, you should be introduced to it."

The room wasn't large. It was long, narrow, low-ceilinged. At the end nearest the door was a sunken control complex with two seats. Ti tapped the wall. "The computer extends downward for three levels from here. I don't imagine you've been behind a Martri stage before?"

They shook their heads.

"A good deal of mystery is made of it," Ti said. "But the difficulty lies in the basic programming of the computer. That takes a master! If anything at all is botched, the machine never quite recovers. Few Martri computers in existence might be said to approach perfection. This one comes perhaps closest to it, though it must operate on a much wider scale than any other built so far."

"You programmed it?" Telzey asked.

Ti looked surprised. "Of course! Who else could have been entrusted with it? It demanded the utmost of my skills and discernment. But as for the handling of the computer—the work of the dramateer—that isn't really complicated at all. Linden lacks genius but is technically almost as accomplished at it as I am. You two probably will be able to operate the computer efficiently and to direct Martri-dramas within a few months. After you've been here a year, I expect to find you composing your own dramas."

He stepped down into the control complex, settled into one of the seats, took a brimless cap of wire mesh from a recess and fitted it over his head. "A dramateer cap," he said. "It's not used here, but few dramas are directed from here. Our Martri Stage covers the entire island and the body of water immediately surrounding it, and usually Linden and I prefer to be members of the audience. You're aware that the computer has the capability of modifying a drama while it's being enacted. On occasion, such a modification could endanger the audience. When it happens, the caps enable us to override the computer. That's almost their only purpose."

"How does it work?" Gaziel asked.

Ti tapped the top of his head. "Through microcontacts in my skull," he said. "The dramateer usually verbalizes instructions, but it's not necessary. The thought, if precise enough, is sufficient. It's interesting that no one knows what makes that possible."

He indicated the wall at the far end of the room with a nod. "A check screen. I'll show you a few of the forest puppets."

His hands flicked with practiced quickness about the controls, and a

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view appeared in the screen—a squat low building with sloping walls, standing in a wide clearing among trees. That must be the control fort Remiol and Eshan had talked about.

The screen flickered. Telzey felt a pang in the center of her forehead. It faded, returned. She frowned. She almost never got headaches . . .

Image in the screen—heavily built creature digging in the ground with clawed feet. Gaziel watched Ti, lips slightly parted, blue eyes intent. Ti talking: ". . . No precise natural counterpart but we've given it a viable metabolism and, if you will, viable instincts. It's programmed to nourish itself, and does. Weight over two tons—"

The pain—a rather mild pain—in Telzey's head shifted to her temples. It might be an indication of something other than present tensions.

An inexperienced or clumsy attempt by a telepath to probe a resistant human mind could produce reactions which in turn produced the symptom of a moderately aching head.

And Linden was a clumsy psi.

It could be the human original he was trying to probe, Telzey thought, but it could as well be the Martri copy, whose head presumably would ache identically. Linden might be playing his own game—attempting to establish secret control over Ti's new tools before he had normal psi defenses to contend with . . . Whichever she was, that could be a mistake! If she was resisting the attempt, then some buried psi part of her of which she hadn't been conscious was active—and was now being stimulated by use.

Let him keep on probing! It couldn't harm at all . . .

"What do you think of that beauty?" Ti asked her with a benign smile.

A new thing in the screen. A thing that moved like a thick sheet of slowly flowing yellowish oil along the ground between the trees. Two dark eyes bulged from the forward end. Telzey cleared her throat. "Sort of repulsive," she remarked.

"Yes, and far from harmless. Hunger is programmed into it, and it's no vegetarian. If we allowed it to satisfy its urges indiscriminately, there'd be a constant need to replenish the forest fauna. I'll impel it now into an attack on the fort."

The following mass abruptly shifted direction and picked up speed. Ti tracked it through the forest for a minute or two, then flicked the screen back to a view of the fort. Moments later, the glider came out into the clearing, front end raised, a fanged, oddly glassy-looking mouth gaping wide at its tip. It slapped itself against the side of the fort. Gaziel said, "Could it get in?"

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Ti chuckled comfortably. "Yes, indeed! It can compress itself almost to paper thinness, and if permitted, it would soon locate the gun slits and enter through one of them. But the fort's well armed. When one of our self-sustaining monsters threatens to slip from computer control, the fort is manned and the rogue is directed, or lured, into attacking it. The guns will destroy any of them, though it takes a good deal longer to do than if they were natural animals of comparable size." He smiled. "For them, too, I have plans, though those plans are still far from fruition."

He shut off the screen, turned down a number of switches and got out of the control chair. "We're putting on a full Martridrama after dinner tonight, in honor of your appearance among us," he told them. "Perhaps you'd like to select one you think you'd enjoy seeing. If you'll come down here, I'll show you how to scan through samples of our repertoire."

They stepped down into the pit, took the console seats. Ti explained the controls, moved back and stood watching their faces as they began to scan. Telzey and Gaziel kept their eyes fixed on the small screens before them, studied each drama sample produced briefly, went on to the next. Several minutes passed in silence, broken only by an intermittent muted whisper of puppet voices from the screens. Finally Ti asked blandly, "Have you found something you'd like?"

Telzey shrugged. "It all *seems* as if it might be interesting enough," she said. "But it's difficult to tell much from these samples." She glanced at Gaziel. "What do you think?"

Gaziel, smooth face expressionless, said, "Why don't you pick one out, Ti? You'd make a better selection than we could."

Ti showed even white teeth in an irritated smile.

"You aren't easy to unsettle!" he said. "Very well, I'll choose one. One of my favorites to which I've added a few twists since showing it last." He looked at his watch. "You've seen enough for today. Run along and entertain yourselves! Dinner will be in three hours. It will be a formal one, and we'll have company, so I want to see you come beautifully gowned and styled. Do you know your way back to your room from here?"

They said they did, followed him out of the Dramateer Room, watched as he sealed and locked the door. Then they started back to their room. As they turned into a passage on the next level up, they checked, startled.

V

The blue-haired woman Ti had called Challis stood motionless thirty feet away, looking at them. Pale eyes, pale face . . . The skin

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of Telzey's back began to crawl. Perhaps it was only the unexpectedness of the encounter, but she remembered how Ti had lost color when Challis first appeared; and the thought came that she might feel this way if she suddenly saw a ghost and knew what it was.

Challis lifted a hand now, beckoned to them. They started hesitantly forward. She turned aside as they came up, went to an open door and through it. They glanced at each other.

"I think we'd better see what she wants," Telzey said quietly.

Gaziel nodded, looking quite as reluctant about it as Telzey felt. "Probably."

They went to the door. A narrow dim-lit corridor led off it. Challis was walking up the corridor, some distance away. They exchanged glances again.

"Let's go."

They slipped into the corridor, started after Challis. The door closed silently behind them. They came out, after several corridor turns, into a low wide room, quite bare—the interior of a box. Diffused light poured from floor, ceiling, the four walls. The surfaces looked like highly polished metal but cast no reflections.

"Nothing reaches here," Challis said to them. "We can talk." She had a low musical voice which at first didn't seem to match her appearance, then did. "Don't be alarmed by me. I came here only to talk to you."

They looked at her a moment. "Where did you come from?" Gaziel asked.

"From inside."

"Inside?"

"Inside the machine. I'm usually there, or seem to be. I don't really give much attention to it. Now and then—not often, I believe—I'm told to come out."

"Who tells you to come out?" Telzey said carefully.

Challis looked at her.

"The minds," she said. "The machine thinks on many levels. Thinking forms minds. We didn't plan that. It developed. They're there; they do their work. That's the way they feel it should be. You understand?"

They nodded hesitantly.

"He knows they're there," Challis said. "He sees the indications. He can affect some of them. Many more are inaccessible to him at present, but it's been noted that he's again modified and extended the duplicative processes. He's done things that are quite new, and now he's brought in the new model who is one of you. The model's been analyzed and it was found that it incorporates a quality through which he should be able to gain access to any of the minds in the machine. That's not wanted. If the duplicate made of the model—the other of you—has the same quality, that's wanted even less. If

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it's been duplicated once, it can be duplicated many times. And he will duplicate it many times. It's not his way to make limited use of a successful model. He'll make duplicates enough to control every mind in the machine."

"*We* don't want that," Gaziel said.

Challis's eyes shifted to her.

"It won't happen," she said, "if he's unable to use either of you for his purpose. It's known that you have high resistive levels to programming, but it's questionable whether you can maintain those levels indefinitely. Therefore the model and its duplicate should re-

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move themselves permanently from the area of the machine. That's the logical and most satisfactory solution."

Telzey glanced at Gaziel. "We'd very much like to do it," she said. "Can you help us get off the island?"

Challis frowned.

"I suppose there's a way to get off the island," she said slowly. "I remember other places."

"Do you remember where they keep the aircars here?" said Gaziel.

"Aircars?" Challis repeated. She looked thoughtful. "Yes, he has aircars. They're somewhere in the

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structure. However, if the model and the duplicate aren't able to leave the area, they should destroy themselves. The minds will provide you with opportunities for self-destruction. If you fail, direct procedures will be developed to delete you."

Telzey said after a moment, "But they won't help us get off the island?"

Challis shook her head. "The island is the Martri stage. Things come to it; things leave it. I remember other places. Therefore, there should be a way off it. The way isn't known. The minds can't help you in that."

"The aircars—"

"There are aircars somewhere in the structure. Their exact location isn't known."

Telzey said, "There's still another solution."

"What?"

"The minds could delete him instead."

"No, that's not a solution," said Challis. "He's essential in the maintenance of the universe of the machine. He can't be deleted."

"Who are you?" Gaziel asked.

Challis looked at her.

"I seem to be Challis. But when I think about it, as I'm doing at this moment, it seems it can't be. Challis knew many things I don't know. She helped him in the design of the machine. Her puppet designs were better than his own, though he's learned much more now than she ever knew. And she was one of our most successful models herself. Many puppet lines were her copies, modified in various ways."

She paused reflectively.

"Something must have happened to Challis," she told them. "She isn't there now, except as I seem to be her. I'm patterns of some of her copies in the machine, and no longer accessible to him. He's tried to delete me, but minds always deflect the deletion instructions while indicating they've been carried out. Now and then, as happened here, they make another copy of her in the vats, and I'm programmed to it and told what to do. That's disturbing to him."

Challis was silent for a moment again. Then she added, "It appears I've given you the message. Go back the way you came. Avoid doing what he intends you to do. If you can deactivate the override system, do it. When you have the opportunity, leave the area or destroy yourselves. Either solution will be satisfactory."

She turned away and started off across the glowing floor.

"Challis," said Gaziel.

Challis looked back.

"Do the minds know which of us two is the model?" Gaziel asked.

"That's of no concern to them now," said Challis.

She went on. They looked after her, at each other, turned back toward the corridor. Telzey's head still ached mildly. It continued to

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ache off and on for another hour. Then that stopped. She didn't mention it to Gaziel.

There were thirty-six people at dinner, most of them island employees. Telzey and Gaziel were introduced. No mention was made of a puppet double, and no one commented on their identical appearance, though there might have been a good deal of silent speculation. Telzey gathered from her table companions that they regarded themselves as highly privileged to be here and to be working for Dr. Ti. They were ardent Martriphiles and spoke of Ti's genius in reverent terms. Once she noticed Linden watching her from the other end of the table. She gave him a pleasant smile, and he looked away, expression unchanged.

Shortly after dinner, the group left the building by the main entrance. Something waited for them outside—a shell-like device, a miniature auditorium with curved rows of comfortable chairs. They found their places, Telzey sitting beside Gaziel, and the shell lifted into the air and went floating away across the estate. Night had come by then. The familiar magic of the starblaze hung above the island. White globe lights shone here and there among the trees. The shell drifted down presently to a point where the estate touched a narrow bay of the sea, and became stationary twenty feet above the ground. Ti and Linden, seated at opposite ends of the shell, took out override caps and fitted the woven mesh over their heads.

There was a single deep bell note. The anticipatory murmur of talk about Telzey and Gaziel ended abruptly. The starblaze dimmed out, and stillness closed about them. All light faded.

Then—a curtain shifting again—they looked out at the shore of a tossing sea, a great sun lifting above the horizon, and the white sails of a tall ship sweeping in toward them out of history. There was a sound in the air that was roar of sea and wail of wind and a wild and splendid music.

Ti's Martridrama had begun.

"I liked the first act," Telzey said judiciously.

"But the rest I'd sooner not have seen," said Gaziel.

Ti looked at them. The others of his emotionally depleted audience had gone off to wherever their quarters in the complex were. "Well, it takes time to develop a Martriphile," he observed mildly.

They nodded.

"I guess that's it," Telzey said.

They went to their room, got into their beds. Telzey lay awake a while, looking out through the big open window at tree branches stirring under the starblaze. There was a clean salt sea smell and night coolness on the breeze. She heard dim sounds in the distance. She

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shivered for a moment under the covers.

The Martridrama had been horrible. Ti played horrible games.

A throbbing set in at her temples. Linden was working late. This time, it lasted only about twenty minutes.

She slept.

She came awake again. Gaziel was sitting up in bed on the other side of the room. They looked at each other silently and without moving in the shadowed dimness.

A faint music had begun somewhere. It might be coming out of the walls of the room, or from beyond the window. They couldn't tell. But it was music they'd heard earlier that night, in the final part of the Martridrama. It swelled gradually, and the view outside the window began to blur, dimmed out by slow pulsing waves of cold drama light which spilled into the room and washed over the floor. A cluster of vague images flickered over the walls, then another.

They edged out of bed, met in the center of the room. For an instant, the floor trembled beneath them.

Telzey whispered unsteadily, "I guess Ti's putting us on stage!"

Gaziel gave her a look which said, *We'll hope it's just Ti!* "Let's see if we can get out of this."

They backed off toward the door. Telzey caught the knob, twisted, tugged. The knob seemed suddenly to melt in her hand.

"Over there!" Gaziel whispered.

There was blackness beyond the window now. A blackness which shifted and stirred. The outlines of the room were moving, began to flow giddily about them. Then it was no longer the room.

They stood on the path of a twisting ravine, lit fitfully by reddish flames lifting out of the rocks here and there, leaping over the ground and vanishing again. The upper part of the ravine was lost in shadows which seemed to press down closely on it. On either side of the path, drawn back from it only a little, was unquiet motion, a suggestion of shapes, outlines, which appeared to be never quite the same, or in the same place, from moment to moment.

They looked back. Something squat and black was walking up the path toward them, its outlines wavering here and there as if it were composed of dense smoke. They turned away from it, started along the path. It was wide enough to let them walk side by side, but not much wider.

Gaziel breathed, "I wish Ti hadn't picked this one!"

Telzey was wishing it, too. Perhaps they were in no real danger. Ti certainly shouldn't be willing to waste them if they made a mistake. But they'd seen Martridrama puppets die puppet deaths in this ravine tonight; and if the minds of which Challis had spoken existed

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and were watching, and if Ti was *not* watching closely enough, opportunities for their destruction could be provided too readily here.

"We'd better act exactly as if it's real!" Telzey murmured.

"I know."

To get safely out of the ravine, it was required to keep walking and not leave the path. The black death which followed wouldn't overtake them unless they stopped. Whatever moved along the sides of the ravine couldn't reach them on the path. There were sounds and near-sounds about them, whispers and a hungry whining, wisps of not quite audible laughter, and once a sharp snarl that seemed inches from Telzey's ear. They kept their eyes on the path, which mightn't be too stable, ignoring what could be noticed along the periphery of their vision.

It shouldn't go on much longer, Telzey told herself presently—and then a cowled faceless figure, the shape of a man but twice the height of a man, rose out of the path ahead and blocked their way.

They came to a startled stop. That figure hadn't appeared in the ravine scene they'd watched. They glanced back. The smoky black thing was less than twenty feet away, striding steadily closer. On either side, there was an abrupt eager clustering of flickering images. The cowled figure remained motionless. They went on toward it. As they seemed about to touch it, it vanished. But the other shapes continued to seethe about now in a growing fury of activity.

The ravine vanished.

They halted again—in a quiet, dim-lit passage, a familiar one. There was an open door twelve feet away. They went through it, drew it shut, were back in the room assigned to them. It looked ordinary enough. Outside the window, tree branches rustled in a sea wind under the starblaze. There were no unusual sounds in the air.

Telzey drew a long breath, murmured, "Looks like the show is over!"

Gaziel nodded. "Ti must have used his override to cut it short."

Their eyes met uneasily for a moment. There wasn't much question that somebody hadn't intended to let them get out of that scene alive! It hadn't been Ti; and it didn't seem very likely that it could have been Linden . . .

Telzey sighed. "Well," she said, "everyone's probably had enough entertainment for tonight! We'd better get some sleep while we can."

VI

Ti had a brooding look about him at the breakfast table. He studied their faces for some moments after they sat down, then inquired how they felt.

"Fine," said Telzey. She smiled at him. "Are just the three of us

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having breakfast here this morning?"

"Linden's at work," said Ti.

"We thought your wife might be eating with us," Gaziel told him.

Ti made a sound between a grunt and a laugh.

"She died during the night," he said. "I expected it. She never lasts long."

"Eh?" said Telzey.

"She was a defective puppet," Ti explained. "An early model, made in the image of my wife Challis, who suffered a fatal accident some years ago. A computer error, which I've been unable to eradicate, causes a copy of the puppet to be produced in the growth vats from time to time. It regards itself as Challis, and because of its physical similarity to her, I don't like to disillusion it, or dispose of it." He shrugged. "I have a profound aversion to the thing, but its defects always destroy it again within a limited number of hours."

He gnawed his lip, observed dourly, "Your appetites seem undiminished! You slept well?"

They nodded. "Except for the Martri stuff, of course," said Gaziel.

"What was the purpose of that?" Telzey asked.

"A reaction test," said Ti. "It didn't disturb you?"

"It was scary enough," Telzey said. "We knew *you* didn't intend to kill us, but at the end it looked like the computer might be getting carried away. Did you have to override it?"

Ti nodded. "Twice, as a matter of fact! It's quite puzzling! That's a well-established sequence—it's been a long time since the computer, or a puppet, attempted a logic modification."

"Perhaps it was because we weren't programmed puppets," Gaziel suggested. "Or because one of us wasn't a puppet at all."

Ti shook his head. "Under the circumstances, that should make no difference." His gaze shifted from one to the other. For an instant, something unpleasant flickered in his eyes. "You may be almost too stable!" he remarked. "Well, we shall see—"

"What will we be doing today?" Telzey asked.

"I'm not certain," Ti said. "There may be various developments. You'll be on your own part of the time, at any rate, but don't go roaming around the estate. Stay in the building area where I can have you paged if I want you."

They nodded. Gaziel said, "There must be plenty of interesting things to see in the complex. We'll look around."

They had some quite definite plans for looking around. The longer Ti stayed busy with other matters during the following hours, the better . . .

It didn't work out exactly as

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they'd hoped then. They'd finished breakfast and excused themselves. Gaziel had got out of her chair; Telzey was beginning to get out of hers.

There was something like a dazzling white flash inside her head.

And she was in darkness. Reclining in some kind of very comfortable chair—comfortable except for the fact that she was securely fastened to it. Cool stillness about her. Then a voice.

It wasn't mind-talk, and it wasn't sound picked up by her ears. Some stimulation was being applied to audio centers of her brain.

"You must relax and not resist," she heard. "You've been brought awake because you must try consciously not to resist."

Cold fear welled through her. Ti had showed them the programming annex of the Martri computer yesterday. She was there now—they were trying to program her! Something was fastened about her skull. Feelings like worm-crawlings stirred in her head.

She tried to push the feelings away. They stopped.

"You must relax," said the voice in her audio centers. "You must not resist. Think of relaxing and of not resisting."

The worm-crawlings began again. She pushed at them.

"You are not thinking of relaxing and not resisting," said the voice. "Try to think of that."

So the programming annex knew what she was and was not thinking. She was linked into the computer. Ti had said that if a thought was specific enough . . .

"We've been trying for almost two hours to get you programmed," Ti said. "What was your experience?"

"Well, I couldn't have been awake for more than the last ten minutes," Telzey said, her expression sullen. "I don't know what happened the rest of the time."

Linden said from a console across the room, "We want to know what happened while you were awake."

"It felt like something was pushing around inside my head."

"Nothing else?" said Ti.

"Oh, there was a kind of noise now and then."

"Only a noise? Can you describe it?"

She shrugged. "I don't know how to describe it. It was just a noise. That was inside my head, too." She shivered. "I didn't like any of it! I don't want to be programmed, Ti!"

"Oh, you'll have to be programmed," Ti said reasonably. "Let's be sensible about this. Were you trying to resist the process?"

"I didn't know how to resist it," Telzey said. "But I certainly didn't want it to happen!"

Ti rubbed his chin, looking at her, asked Linden, "How does the annex respond now?"

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"Perfectly," Linden said quietly.

"Well, see how the other subject reacts. Telzey, you wait outside—that door over there. Linden will conduct you out of the annex in a few minutes."

Telzey found Gaziel standing in the adjoining room. Their eyes met. "Did you get programmed?" Gaziel asked.

Telzey shook her head.

"No. Some difficulty with the annex—almost like it didn't want me to be programmed."

Gaziel's eyelids flickered; she nodded quickly, came over, watching the door, slipped something into Telzey's dress pocket, stepped back. "I suppose it's my turn now," she said.

"Yes," Telzey said. "They were talking about it. It's like little worms pushing around inside your head, and there's a noise. Not too bad really, but you won't like it. You'll wish there were a way you could override it."

Gaziel nodded again.

"I hope it won't take with me either," she said. "The idea of walking around programmed is something I can't stand!"

"If it doesn't work on you, maybe Ti will give up," Telzey said.

The door opened and Linden came out. He looked at Gaziel, jerked his thumb at the doorway. "Dr. Ti wants to see you now," he told her.

"Good luck!" Telzey said to Gaziel. Gaziel nodded, walked into the other room. Linden closed the door on her.

"Come along," he said to Telzey. "Dr. Ti's letting you have the run of the building, but he doesn't want you in the programming annex while he's working on the other one."

They started from the room. Telzey said, "Linden—"

"Dr. Linden," Linden said coldly.

Telzey nodded. "Dr. Linden. I know you don't like me . . ."

"Quite right," Linden said. "I don't like you. You've brought me nothing but trouble with Dr. Ti since you first showed up in Draise! In particular, I didn't appreciate that psi trick you pulled on me."

"Well, that was self-defense," Telzey said reasonably. "What would you do if you found someone trying to pry around in your mind? That is, if you could do what I did . . ." She looked reflective. "I don't suppose you can, though."

Linden gave her an angry look.

"But even if you don't like me, or us," Telzey went on, "you really should prefer it if Ti can't get us programmed. You're important to him because you're the only telepath he has. But, if it turns out we're both psis, or even only the original one, and he can control us, you won't be nearly so important any more."

Linden's expression was watchful

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now. "You're suggesting that I interfere with the process?" he said sardonically.

Telzey shrugged. "Well, whatever you think you can do."

Linden made a snorting sound. "I'll inform Dr. Ti of this conversation," he told her. He opened another door. "Now get out of my sight!"

She got. Linden had been pushed as far as seemed judicious at present.

She took the first elevator she saw to the third floor above ground level, went quickly to their room. The item Gaziel had placed in her pocket was a plastic package the size of her thumb. She unsealed it, unfolded the piece of paper inside, which was covered with her private shorthand. She read:

Comm office on level seven, sect. eighteen. It's there. Usable? Janitor-guard, Togelt, buttered up, won't bother you. Comm man, Rodeen, blurs up like Remiol on stim. Can be hypnoed straight then! No one else around. Got paged before finished. Carry on. Luck.

Me

Telzey pulled open the wardrobe, got out a blouse and skirt combination close enough to what Gaziel had been wearing to pass inspection by Togelt and Rodeen, went to a mirror and began arranging her hair to match that of her double. Gaziel had made good use of the morning! Locating a communicator with which they might be able to get out a message had been high on their immediate priority list, second only to discovering where the island's air vehicles were kept.

Telzey went still suddenly, eyes meeting those of her mirror image. Then she nodded gently to herself. The prod she'd given Linden had produced quick results! He *was* worried about the possibility that Ti might acquire one or two controlled psis who could outmatch him unless he established his own controls first.

Her head was aching again—

Preparations has been completed meanwhile. She got out a small map of the central complex she'd picked up in the office while Ti was conducting them around the day before. It was informative quite as much in what it didn't show as in what it showed. Sizable sections of the upper levels obviously weren't being shown. Neither was most of the area occupied by the Martri computer, including the Dramateer Room. Presumably these were all places barred to Ti's general personnel. That narrowed down the search for aircars considerably. They should be in one of the non-indicated places which was also near the outer wall of the complex.

Rodeen was thin, sandy-haired, in his early twenties. He smiled happily at sight of Telzey. His was a lonely job; and Gaziel had left him with the impression that he'd

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been explaining the island's communication system to her when Ti had her paged. Telzey let him retain the impression. A few minutes later, she inquired when he'd last been off Ti's island. Rodeen's eyes glazed over. He was already well under the influence.

She hadn't worked much with ordinary hypnosis because there'd been no reason for it. Psi, when it could be used, was more effective, more dependable. But in her general study of the mind, she'd learned a good deal about the subject. Rodeen, of course, was programmed against thinking about the communicator which could reach other points on Orado; it took about twenty minutes to work through that. By then, he was no longer in the least aware of where he was or what he was doing. He opened a safe, brought out the communicator, set it on a table.

Telzey looked it over, asked Rodeen a few questions. Paused then. Quick footsteps came along the passage outside the office. She went to the door.

"What did Togelt think when he saw you?" she asked.

"That I was your twin, of course," Gaziel said. "Amazing similarity!"

"Ti sure gave up on you fast!"

Gaziel smiled briefly. "You sure got that programming annex paralyzed! Nothing would happen at all—that's why he gave up. How did you override it?"

"It knew what I was thinking. So I thought the situation was an override emergency which should be referred to the computer director," Telzey said. "There was a kind of whistling in my head then, which probably was the director. I referred to the message we got from Challis and indicated that letting us be programmed by Ti couldn't be to the advantage of the Martri side. Apparently, they saw it. The annex went out of business almost at once. Did Ti call for Linden again?" Her headache had stopped some five minutes ago.

Gaziel nodded. "We'll have some time to ourselves again—Ti'll page us when he wants us."

She'd come in through the door. Her gaze went to the table, and she glanced quickly at Telzey's face. "So you found it. We can't use it?"

"Not until we get the key that turns it on," Telzey said, "and probably only Ti knows where it is. Nobody else ever uses the gadget, not even Linden."

"No good to us at the moment then." Gaziel looked at Rodeen who was smiling thoughtfully at nothing. "In case we get hold of the key," she said, "let's put in a little posthypnotic work on him so we can just snap him back into the trances another time . . ."

They left the office shortly, having restored Rodeen to a normal condition, with memories now only of a brief, but enjoyable, conversation he'd had with the twins.

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Telzey glanced at her watch. "Past lunch time," she remarked. "But Ti may stay busy a while today. Let's line up the best spots to look for aircars."

The complex map was consulted. They set off for another upper-level section.

"That blur-and-hypnotize them approach," said Gaziel, "might be a way to get ourselves a gun—if they had armed guards around."

Telzey glanced at her. So far, they'd seen no armed guards in the complex. With Ti's employees as solidly programmed as they were, he didn't have much need even for locked doors. "The troops he keeps to hunt down rambunctious forest things have guns, of course," she said. "But they're pretty heavy caliber."

Gaziel nodded. "I was thinking of something more inconspicuous—something we could shove under Ti's, or Linden's, nose if it got to be that kind of situation."

"We'll keep our eyes open," Telzey said. "But we should be able to work out a better way than that."

"Several, I think," said Gaziel. She checked suddenly. "Speaking of keeping our eyes open—"

"Yes?"

"That's an elevator door over there, isn't it?"

"That's what their elevator doors look like," Telzey agreed. She paused. "You think that one doesn't show on the map?"

"Not as I remember it," Gaziel said. "Let's check—section three seventeen dash three."

They spread the map out on the floor, knelt beside it. Telzey shifted the scale enlargement indicator to the section number. The map surface went blank; then a map of the section appeared. "We're—here!" said Gaziel, finger tapping the map. "And, right, that elevator doesn't show—doesn't exist for programmed personnel. Let's see where it goes!"

They opened the door, looked inside. There was an on-off switch, nothing to indicate where the elevator would take them. "Might step out into Ti's office," Telzey said.

Gaziel shrugged. "He knows we're exploring around."

"Yes. But he could be in a pretty sour mood right now." Telzey shrugged in turn. "Well, come on!"

They stepped into the elevator. The door closed, and Telzey turned the switch. Some seconds passed. The door opened again.

They stood motionless, looking out and around. Gaziel glanced over at Telzey, shook her head briefly.

"It can't be as easy as *that!*" she murmured.

Telzey bit her lip. "Unless it's locked . . . Or unless there's a barrier field that won't pass it . . ."

The door had opened at the back of a large sun-filled porch garden. Seemingly, at least, the porch was open to the cloudless sky beyond.

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There were rock arrangements, small trees, flower beds stirring in a warm breeze. Near the far end was a graveled open area—and a small aircar was parked on it. No one was in sight.

No, Telzey thought, escape from Ti's island couldn't be so simple a matter! There must be some reason why they couldn't use the aircar. But they had to find out what the reason was.

They moved forward warily together, a few steps, emerged from the elevator, looked around, listening, tensed. Gaziel started forward again. Telzey suddenly caught her arm, hauled hard. Back they went stumbling into the elevator.

"What's the matter?" Gaziel whispered.

Telzey passed her hand over her mouth, shook her head. "Close!" she muttered. "The sun—"

Gaziel looked. Her eyes widened in comprehension. "Should be overhead, this time of day!"

"Yes, it should." It wasn't. Its position indicated it might be midmorning or midafternoon on the garden porch.

The garden porch—a Martri stage.

"They set it up for us!" Gaziel murmured. "We asked Challis where we could find aircars."

Telzey nodded. "So they spotted us coming and spun in a scene from some drama—to get us out there, on stage!"

"They almost did. Look at it now!" Gaziel said softly. "Nothing's moving."

The garden porch had gone still, dead still. No eddy of air disturbed the flower beds; no leaf lifted. There was total silence about them.

"They've stopped the scene," Telzey whispered. "Waiting to see if we won't still try to reach the car."

"And find out we've become part of the action! Wonder what . . . It's moving again!"

The garden growth stirred lazily, as before. A breeze touched their faces. Some seconds passed. Then they heard a hoarse shout, a high cry of fear, and, moments later running steps. A young man and a young woman burst into view from behind a cluster of shrubs, darted toward the aircar.

The Martri scene began to fade. Off to the left, another man was rising out of concealment, holding a gun in both hands. He took unhurried aim at the pair as they pulled open the door of the car. Then flame tore through the two bodies, continued to slash into them as they dropped writhing to the ground, dimming out swiftly now with everything about them.

Telzey turned the elevator switch. The door slid shut. They looked at each other.

"If you hadn't noticed the sun!" Gaziel said. She drew in a long breath. "If we'd . . . the computer would hardly have had to modify

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that scene at all to get us deleted!"

"Wish those minds weren't in quite such a hurry about that," Telzey said.

The elevator door opened. They stepped out into the hall from which they'd entered it.

VII

"Oh, certainly we have permanent Martri stages here in the complex," Ti said at lunch. "They're generally off limits to personnel, but you two are quite free to prowl about there if you like. The equipment's foolproof. Remind me to give you a chart tomorrow to help you locate some of them."

He appeared affable, though bemused. Now and then he regarded them speculatively. He'd spent all morning, he told them, trying to track down the problem in the programming annex. The annex, a relatively simple piece of Martri equipment, was Linden's responsibility; but Linden was limited.

Ti shrugged.

"I'll work it out," he said. "It's possible I'll have to modify the overall programming approach used on you. Meanwhile . . . well, Linden has business offices on the level above your room. I'd like you to go there after you finish. He's to carry your general indoctrination a step further this afternoon. Go up the stairs nearest your room and turn left. You won't have any trouble finding him."

They didn't. They came to a main office first, which was a sizable one where half a dozen chatty and cheerful-looking young women were at work. One of them stood up and came over.

"Dr. Linden?" she said. "Oh, yes. He's expecting you."

They followed her through another room to Linden's private office. He arose behind his desk as they came in.

"Dr. Ti informed me you were on your way here," he said. He looked at the young woman. "I'll be out of the office a while. Take care of things."

"How long do you expect to be gone, sir?" she asked.

"Between one and two hours." Linden gave Telzey and Gaziel a twisted smile. "Let's go!"

He led them up a narrow passage to an alcove where sunlight flooded in through colored windows. Here was a door. Linden unlocked it, but didn't open it immediately.

"I'll explain the situation," he said, turning back to them. "I told Dr. Ti in Draise that Telzey might become dangerous, and advised him to have her destroyed. But he was intrigued by the possibilities he felt he saw in her, and in creating puppet doubles of her." Linden shrugged. "Well, that's his affair. He's been attempting to shake you up psychologically—Martri programming takes hold best on minds that have been reduced to a state of

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general uncertainty. However, his methods haven't worked very well. And he now suspects you may have deliberately caused the malfunction of the programming annex this morning. So he's decided to try a different approach—and for once in this matter, I find myself in complete accord with him!"

"What's the new approach?" Telzey asked guardedly.

Linden smiled.

"We have devices in the rooms behind that door," he said, "which were designed to put difficult subjects into a docile and compliant frame of mind. I'm happy to say that various phases of the process are accompanied by intense physical pain—and believe me, you're getting the full treatment!"

Telzey said, "One of us is Gaziel. She hasn't done anything to you. Why do you want to give her the full treatment?"

Linden shrugged. "Why not? Subjectively you're both Telzey, and as far as I'm concerned, you're equally insufferable. You'll find out which of you is Telzey in fact when you're supposed to. I'll make no distinctions now. When I feel you've been sufficiently conditioned, I'll put you through the psi depressant procedure again to make sure no problems begin to develop in that area. Then I'll report to Dr. Ti that his subjects are ready for further programming sessions."

He smiled at Telzey.

"You," he said, "had the effrontery to suggest that it would be to my advantage if Dr. Ti gave up his plan to program the two of you. I don't agree. He feels now that the experiment probably will fail as such, but will produce valuable new information. So he'll continue with it until neither of you has enough mind left to be worth further study. I see nothing undesirable in that prospect!"

He opened the door he'd unlocked, glanced back down the passage in the direction of the offices.

"This kind of thing could disturb the illusions of the work staff," he remarked. "Subjects experiencing the docility treatment make a remarkable amount of noise. But the place is thoroughly soundproofed, so that's no problem. You're at liberty to yowl your heads off in there. I'll enjoy listening to it. In you go!"

He took each of them by an arm and shoved them through the door into the room beyond. He followed, drawing the door shut behind him, and locked it from inside. As he started to turn back toward them, Telzey dropped forward and wrapped herself around his ankles. Linden staggered off balance and came down, half on top of her. Gaziel came down on top of him.

It was a brisk scramble. Linden was somewhat awkward, but big enough and strong enough to have handled either of them readily. To-

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gether, hissing, clawing for his eyes, clinging to his arms, kicking at his legs, they weren't being at all readily handled. They rolled across the room in a close-locked, rapidly shifting tangle, Linden trying to work an arm free and making inarticulate sounds of surprised fury. A table tipped over; a variety of instruments which had been standing on it crashed to the floor. Telzey saw one of them within reach, let go of Linden, snatched it up—mainly plastic but heavy—slammed it down on Linden's skull. He yelled. She swung down again with both hands, as hard as she could. The gadget broke, and Linden lay still.

"His keys—" she gasped.

"Got them!" Gaziel said.

They went quickly through Linden's pockets, found nothing else they could use. He was breathing noisily but hadn't moved again. "We'll just leave him locked in here," Telzey said as they scrambled to their feet. "That's a solid door—and he said the place was soundproof."

They unlocked the door, drew it cautiously open. Everything was quiet. They slipped out, locked the door, started down the passage. Somewhere another door opened; they heard feminine voices, turned back and ducked into the alcove across from the door.

"Once we're past the office area, we should be able to make it downstairs all right," Telzey said softly.

Gaziel studied her a moment, lips pursed. "Now we start them thinking we're hiding out in the forest, eh?"

"Yes. Looks like the best move, doesn't it?"

Gaziel nodded. "Wish we'd had a few more hours to prepare for it, though. Getting to the aircars is likely to be a problem."

"I know. It can't be helped."

"No," Gaziel agreed. "Between Linden and Ti planning to mess up our minds and the Martri computer waiting around to introduce some fancy deletion procedure, we'd better try to clear out of here the first chance we get! And this is it."

The side door to Linden's armored car opened to the third key Telzey tried. They slipped inside, drew the door shut.

Telzey settled into the driver's seat. "I'll get it started. Look around and see what he has here."

"Handguns," Gaziel announced a moment later.

"A kind we can use?"

"Well, they're heavy things. I'll find out how they work." There were clicking noises as she checked one of the guns. The car engine came to life. Telzey eased the vehicle back from the wall of the building, turned it around. It went gliding off quickly across the lawn toward the nearest stand of garden trees. Gaziel looked over at her. "It handles all right?"

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"It handles fine! Beautiful car. I'll come up on the taloaks from the other side."

"We can use the guns," Gaziel said. "I'll tie two of them to my belt for now. Nothing much else."

Taloaks made great climbing trees, and a sizable grove of them stretched to within a hundred yards of the residential area of the main building complex. Linden's car slipped up on the trees from the forest side of the estate, edged in among thickets of ornamental ground cover, stopped in the center of one of the densest clusters of growth. Its side door opened. Telzey climbed from the driver's seat to the top of the door, then on to the top of the car, followed by Gaziel. Each of them now had one of the big handguns Gaziel had discovered fastened to her dress belt. A thick taloak branch hung low over the car. They scrambled up to it, moved on.

Some five minutes later, they sat high in a tree near the edge of the grove, straddling branches six feet apart. They could watch much of the ground in front of the building through the leaves and were safely out of sight themselves. So far, there'd been no indication of activity in the area.

"It might be a while before they start looking for Linden," Gaziel said presently.

"Unless Ti checks in to see how our indoctrination is coming along," Telzey said.

"Yes, I suppose Ti's likely to—"

Gaziel's voice broke off. Telzey looked over at her. She sat still, frozen, staring down at Linden's gun which she was holding in both hands.

"I'm sorry," Telzey said after a moment. "I wasn't really sure myself until just now."

Gaziel slowly refastened the gun to her belt, lifted her head.

"I'm nothing," she said, gray-faced. "A copy! A wirehead."

"You're me," Telzey said, watching her.

Gaziel shook her head. "I'm not you. You felt me get that order?"

Telzey nodded. "Ti's working through the computer. You were to take control of me—use the gun if you had to—then get me and Linden's car back to the main entrance."

"And I'd have done it!" Gaziel said. "I was about to point the gun at you. You canceled the order—"

"Yes. I blanked out the computer contact."

Gaziel drew a ragged breath. "So you're back to being a psi," she said. "How did that happen?"

"Linden's been trying to probe me. Off and on since yesterday. He pushed open a few channels finally. I finished doing the rest of it about an hour ago."

Gaziel nodded. "And you took him over after you knocked him out. What's the real situation now?"

Telzey said, "Ti did check. He

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had his own key to the treatment rooms. I woke Linden up and had him tell Ti a story that got things boiling. What it amounts to is that we put guns on Linden and got his personal standard communicator from him before we knocked him out. We plan to find a spot in the forest where we can hole up in his car and call for help. So they're coming after us with their other armored cars—eleven of them—in case the order Ti just gave you doesn't bring us back."

Gaziel stared at her a moment, face still ashen. "Ti's going with them?"

"Yes. And he's taking Linden along. They're about to start. I'm still in contact with Linden, of course, and I know how to get to the aircars. But they've stationed some guards at key points in the complex. It will take us some time to maneuver around those, and if we're seen, Ti could come back with his patrols to stop us. So we have to make sure first they can't get back." She added, "There they are now!"

A groundcar swept around the curve of the building complex. Others followed at fifty-yard intervals. They arrowed across the lawns in the direction of the forest wall, vanished behind trees. Telzey said, "Ti and Linden are in Five and Six. We can start down." She looked at Gaziel. "You are coming with me, aren't you?"

"Oh, I'm coming with you!" Gaziel said. "I'll help any way I can. I simply want all this to stop!"

VIII

Telzey locked the last control into position, pushed her hair back out of her face, looked over at Gaziel watching her from the edge of the console pit. A low heavy humming filled the Dramateer Room. "We're set," she said.

"Any detectable reaction from the minds yet?" asked Gaziel.

Telzey bit her lip reflectively. "Well, they're here, all right!" she said. "Around us. I can feel them. Like a whole army. Spooky! But they're just watching, I think. They haven't tried to interfere, so it doesn't seem they're going to be a problem. After all, we are getting out. It's what they wanted, and they seem to understand that we're doing it." She added, "Not that I'd like to tempt them by walking across one of their stages! But we won't have to do that."

"Just what have you been doing?" Gaziel said. "I couldn't begin to follow it."

"I couldn't either," Telzey said. "Linden did it. I sort of watched myself go through the motions." She flexed her fingers, looked at them. "Ti's forest things have cut the groundcars off from the gate and are chasing them up to the fort. One of the cars—well, they caught it. Ti and Linden already are in the fort. Ti's tried to contact

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the main complex, but the comm line leads through the computer and it's been cut off there. He knows the computer must be doing it, of course, and he's tried to override."

"The override system's deactivated?"

"That's the *first* thing we did," Telzey said. "They'll need a calculated minimum of thirty-two minutes to wipe out the forest puppets from the fort."

"That will get us to the aircars?"

"It should, easily. But we'll have a good deal more time. The first groundcar that comes back through the gate into the estate will start up a section of a Ti Martridrama—the third act of 'Armageddon Five.' That's about what it sounds like, and its stage is the whole estate, except for the central building complex. Ti won't be able to get here until Act Three's played out—and it takes over an hour. We want to keep him bottled up as long as possible, of course—"

She jerked suddenly, went still for a moment, shook her head.

"Linden just died!" she said then. "Ti shot him. He must have realized finally I had Linden under control. Well, it shouldn't change matters much now."

She got out of the console chair. "Come on! Mainly we'll have to be a little careful. I know where the guards are, but it'll be better if we don't run into anybody else either."

It took them eighteen minutes to work their way unseen through the building, and get into the aircar depot. A line of supply trucks stood there, four smaller aircars. They got into one of the cars. The roof of the depot opened as Telzey lifted the car toward it. The car halted at that point.

From a car window, they aimed Linden's guns at the power section of the nearest truck. After some seconds, it exploded, and the trucks next to it were instantly engulfed in flames. A chain reaction raced along the line of vehicles. They closed the window, went on up. Nobody was going to follow them from Ti's island. The energy field overhead dissolved at their approach, closed again below them. The car went racing off across the sunlit sea toward the southern mainland.

Gaziel sighed beside Telzey, laid the gun she'd been using down on the seat.

"I did have the thought," she said, "that if I shot you now and pushed you out, I could be Telzey Amberdon."

Telzey nodded.

"I knew you'd be having the thought," she said, "because I would have had it. And I knew you wouldn't do it then. Because I wouldn't do it."

"No," Gaziel said. "Only one of us can be the original. That's not your fault." She smiled, lazily, for the first time in an hour. "Am I dying, Telzey?"

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"No," Telzey said. "You're going to sleep, other me. Don't fight it."

Some six weeks later, Telzey sat at a small table in a lounge of the Orado City Space Terminal, musing on information she'd received a few hours before.

It happened now and then that some prominent citizen of the Federation didn't so much disappear as find himself becoming gradually erased. It might be reported for a while that he was traveling, had been seen in one place or another, and eventually then that he'd settled down in quiet retirement, nobody seemed to know quite where. Meanwhile his enterprises were drifting into other hands, his properties dissolved, his name was mentioned with decreasing frequency. In the end, even former personal acquaintances seemed almost to forget he'd existed.

Thus it would be with Wakote Ti. He'd demanded a public trial. With his marvelous toys taken from him and an end made to the delights of unrestricted experimentation, he'd felt strongly that at least the world must be made aware of the full extent of his genius. The Federation's Psychology Service, which sometimes seemed the final arbiter on what was good for the Federation and sometimes not, decreed otherwise. The world would be told nothing, and Ti would be erased. He'd remain active, however; the Service always found a use for genius of any kind.

"What about all the new principles he discovered?" Telzey had asked Klayung, her Service acquaintance. "He must have been way ahead of anyone else there."

"To the best of our knowledge," said Klayung, "he was very far ahead of anyone else."

"Will that be suppressed now?"

"Not indefinitely. His theories and procedures are being carefully recorded. But they won't be brought into use for a while. Some toys seem best reserved for wiser children than we have around generally at present."

It was on record that Ti had deeded a private island to the planetary government, which would turn it into the site of a university. The illusory bank accounts of his innocent employees had acquired sudden reality. The less innocent employees were in Rehabilitation. His puppets and Martri equipment had disappeared.

Telzey watched a girl in a gray business suit come into the lounge, sent out a light thought to her.

"Over here!"

Acknowledgment returned as lightly. The girl came up to the table, sat down across from Telzey.

"You're taller than I am now, aren't you?" Telzey said.

Gaziel smiled. "By about half an inch."

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Taller more slender. The hollows under the cheek bones were more pronounced. There'd been a shift in the voice tones.

"They tell me I'll go on changing for about a year before I'm the way I want to be," Gaziel said. "There'll still be a good deal of similarity between us then, but no one would think I'm your twin." She regarded Telzey soberly. "I thought I didn't really want to see you again before I left. Now I'm glad I asked you to meet me here."

"So am I," Telzey said.

"I've become the sort of psi you are," said Gaziel. "Ti guessed right about that." She smiled briefly. "Some of it's surprised the Service a little."

"I knew it before we left the island," Telzey said. "You had everything I had. It just hadn't come awake."

"Why didn't you tell me?"

"I didn't dare do anything about you myself. I just got you to the Service as quickly as I could."

Gaziel nodded slowly. "I was on the edge then, wasn't I? I remember it. Have they told you how I've been doing?"

"No. They wouldn't. They said that if you wanted me to know, you'd tell me."

"I see." Gaziel was silent a moment. "Well, I want you to know. I hated you for a while. It wasn't reasonable, but I felt you were really the horrid changeling who'd pushed me out of *my* life, away from *my* family and friends. That was even after they'd taken the puppet contacts out of my head. I could think of explanations why Ti had planted them there, in the real Telzey." She smiled. "We're quite ingenious aren't we?"

"Yes, we are," Telzey said.

"I got past that finally. I knew I wasn't Telzey and never had been. I was Gaziel, product of Wakote Ti's last and most advanced experiment. Then, for a while again, I was tempted. By that offer. I could become Gaziel Amberdon, Telzey's identical twin, newly arrived on Orado—step into a ready-made family, a ready-made life, a ready-made lie. Everything really could be quite simple for me. That was a cruel offer you made me, Telzey."

"Yes, it was cruel," Telzey said. "You had to have a chance to see if it was what you wanted."

"You knew I wouldn't want it?"

"I knew, all right. You'd have stayed a copy then, even if no one else guessed it."

Gaziel nodded. "I'm thanking you for the offer now. It did help me decide to become Gaziel who'll be herself and nobody's copy."

"I'd like to think," Telzey told her, "that this isn't the last time we'll be meeting."

"When I'm free of the Telzey pattern and have my own pattern all the way, I'll want to meet you again," Gaziel said. "I'll look you up." She regarded Telzey a mo-

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ment, smiled. "In three or four years, I think."

"What will you be doing?"

"I'll work for the Service a while. Not indefinitely. After that, I'll see. Did you know I was one of Ti's heirs?"

"One of his heirs?"

"He isn't dead, of course. I drew my inheritance in advance. I used your legal schooling and found I could make out a rather strong case for paternal responsibility on Ti's part toward me. It was quite a lot of money, but he didn't argue much about it. I think I frighten him now. He's in a nervous condition anyway."

"What about?" Telzey said.

"Well, that Martri computer he had installed on the island is supposedly deactivated. The Service feels it's a bit too advanced for any general use at present. But Ti complains that Challis still comes around now and then. I wouldn't know—nobody else has run into her so far. It seems he arranged for the fatal accident the original Challis had . . ." Gaziel glanced at her watch, stood up. "Time to go aboard. Good-bye, Telzey!"

"Goody-bye," Telzey said. She looked after Gaziel as she turned away. Klayung, who wouldn't discuss Gaziel otherwise, had said thoughtfully, "By the time she's through with herself, she'll be a remarkably formidable human being—"

Gaziel checked suddenly, looked back.

"Poor old Ti!" she said, laughing. "He didn't really have much of a chance, did he?"

"Not against two of us," Telzey said. "Whatever he tried, we'd have got him one way or another." ■

THE ANALYTICAL LABORATORY • SEPTEMBER 1970

PLACE	TITLE	AUTHOR	POINTS
1.	Star Light (Conclusion)	*Hal Clement*	2.04
2.	Lost Newton	*Stanley Schmidt*	2.08
3.	The Wandering Buoy	*A. Bertram Chandler*	3.24
4.	Top Billing	*Jack Wodhams*	3.45
5.	Talk With the Animals	*Stephen Tall*	4.08

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1.	The Tactics of Mistake (Pt. 1)	*Gordon R. Dickson*	1.38
2.	Rescue Squad for Ahmed	*Katherine MacLean*	2.68
3.	Messything	*Lawrence A. Perkins*	2.88
4.	Exodus—Genesis	*John Dalmas*	3.60
5.	The Happiest Day of Your Life	*Bob Shaw*	4.40

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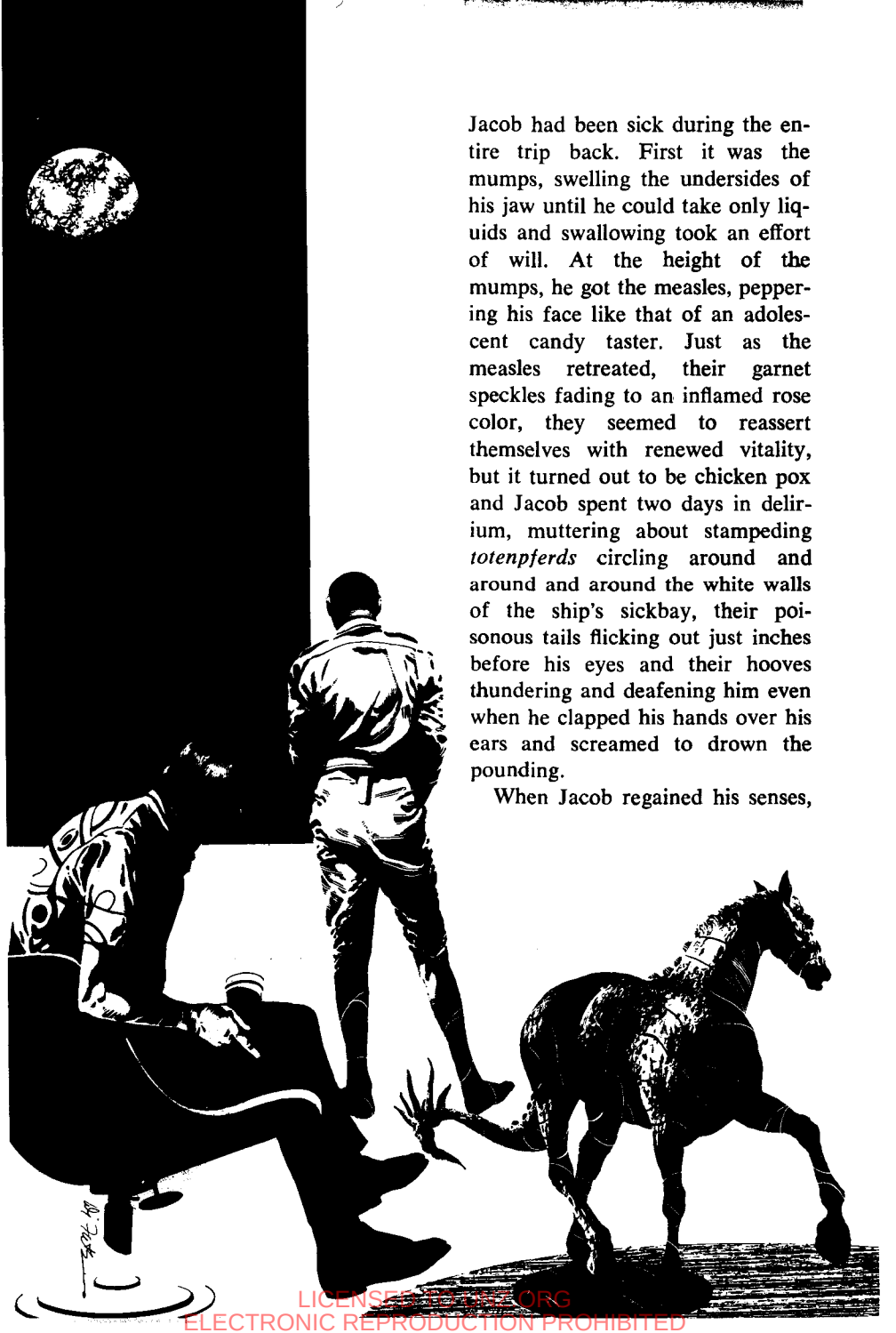

Jacob had been sick during the entire trip back. First it was the mumps, swelling the undersides of his jaw until he could take only liquids and swallowing took an effort of will. At the height of the mumps, he got the measles, peppering his face like that of an adolescent candy taster. Just as the measles retreated, their garnet speckles fading to an inflamed rose color, they seemed to reassert themselves with renewed vitality, but it turned out to be chicken pox and Jacob spent two days in delirium, muttering about stampeding *totenpferds* circling around and around and around the white walls of the ship's sickbay, their poisonous tails flicking out just inches before his eyes and their hooves thundering and deafening him even when he clapped his hands over his ears and screamed to drown the pounding.

When Jacob regained his senses,

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HOMAGE

Just because it was something any normal child learned did not mean that a normal man could do it!

TAK HALLUS

Illustrated by Vincent di Fate

he realized the incongruity of the image. The wild *totenpferds* on Xenos IV, the planet he had left only a month ago after seventeen years of life there, were silent in spite of their horny hooves and deadly. The waist-high "horses" crept up on a man and with a bull-whip flick of their tails would cut through any fabric short of metal weave, scratching the skin of their victim and depositing a poison that paralyzed the skeletal muscles, leaving the prey still alive when a pack of "horses" began eating.

Only the domesticated *totenpferd* was shod and made noise and the domesticated ones had their tails cropped, a precaution more against potential lacerations by the tail than the poison since all of Xenos's human colony had developed a tolerance to it through a mandatory series of innoculations.

But now, as the ship dropped out of hyperspace and the solar system appeared in the ports, Jacob had a sense of coming home, a sense of exhilaration and excitement that momentarily suppressed his remaining symptoms.

"Beautiful, isn't it?"

Jacob looked around from the viewport at Dr. Hurley. The ship's surgeon, a man about Jacob's age but unlike Jacob, who looked ten years older than he was, Dr. Hurley looked younger, except for the pattern of wrinkles splaying out from the corners of his eyes and the forehead that was making its way through his hairline.

"Yes," answered Jacob and turned back to the viewport. They had appeared in normal space about 500 million miles from Earth and the position of the moon, a half-moon from their angle, made it appear the same size as Earth. But there was no mistaking which was which. The moon was precisely divided into bright white and a black whose only contrast with the space around it was an absence of stars, while Earth—Earth, thought Jacob—was a swirl of greens from jade to emerald and blues as pale and watery in some spots as they were rich and deep in others. It was Earth and Jacob felt an unexpected surge of emotion warm his cheeks as he watched.

"You know, Doctor, I haven't been back in seventeen years, since I left at fourteen," said Jacob, still staring out the viewport, but sens-

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ing the other man's presence and attention. "What's it like?"

"The same."

"The same?" asked Jacob, turning his head to look at Dr. Hurley.

"Only more so."

Jacob looked back at Earth. When he spoke, it was in an abstracted way, as if more to himself than the doctor.

"Me, too."

"I know what you mean, Jacob," said Dr. Hurley behind him. Jacob could see the doctor's reflection in the viewport, staring past him at Earth. "Six months is about the longest I'm gone, but even then I feel a certain elation during this part of any trip. I look out at Earth and see that it's still there, unchanged, the same as ever, a constant reference point and say, 'Hurley, how have you changed since you saw it last?' "

Jacob looked away from the viewport and nodded down the corridor in the direction of the ship's lounge.

"Coffee?"

The doctor smiled and Jacob realized Hurley had discovered his one passion, coffee. It wouldn't grow on Xenos and the few ships that passed seldom carried enough for the colony. They began walking toward the lounge.

"What kind of answers do you get, Doctor?"

"To what?"

"When you ask how you've changed."

"Oh, sometimes I get answers, sometimes not. It depends on the trip. The point was that an approach to Earth is somehow conducive to that kind of reflection. If there are any answers, that's the time they come out."

The lounge door slid open ahead of them and they walked in. It was a small room, empty at this hour of the crew's workcycle, with a half dozen tables and one wall that dispensed the galley's food from behind panels. Jacob gestured for Dr. Hurley to sit down and walked to the wall, plucking two cups from the dispenser and filling them under a shiny faucet. Steam rose from the cups and fogged the tap.

"How have *you* changed, Jacob?" asked the doctor after Jacob put the cups on the table and sat down.

"I can't really say. It's been so long I feel like I'm a completely different person and at the same time I'm the same. Except for my childhood on Earth, I grew up on Xenos."

"How do you feel?"

"Excited, anxious, I can't put my finger on it exactly."

"No, I mean physically."

"The doctor in you is asking."

"Yes."

"Weak, I suppose. This trip has taken a lot out of me. By the way, I think I'm coming down with a cold. Do you have anything for it?"

The doctor thought a moment.

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"Frankly, we've pumped you so full of antibiotics the last few weeks that it would be better if you just took two aspirins—"

"And went to bed."

"Yes. I wanted to talk to you about that, Jacob."

"About what?"

"Your illnesses. When we get in orbit, I'd like to do a few tests and have them sent down to Earth for analysis before you go down."

Jacob had expected something like this and as his illnesses had become more complicated, he had begun to dread it.

"And if I flunk your tests?"

"We don't have to worry about that now. The tests are for your own benefit and safety. They won't delay you. The information will be back before the first shuttle reaches our air lock."

"What do you expect to find?"

"I hope nothing, Jacob."

Six hours later the ship was in orbit around Earth, sweeping over continents every few minutes while the crew readied it for the shuttles. Jacob was in his cabin, packing the few things he had brought on the journey: a depthphoto of his family, Barbara, Jimmy and Peter; a manuscript on Xenosian ecological cycles he had promised to deposit with publishers on Earth as a favor to his employer, Dr. Sherman, who wanted to avoid the possible delay of a year if he waited for one of the slow-moving Federation mail packets to make its circuit past Xenos; and a carving of a *totenpferd*, caught in a moment of anger with its wooden tail lashing out and its fierce head turned back baring its teeth. It was made of Native Xenosian wood and Jacob planned to give it to his older sister, a woman now in her early forties who had remained behind with her husband after Jacob's parents decided to leave.

"Jacob," said Dr. Hurley, smiling out of the visiphone with the familiar walls of the sickbay behind him. "I just wanted to let you know that I sent those tissue and blood samples down with a supply shuttle. They should have them analyzed before the first personnel boat gets here."

Jacob felt a momentary irritation with the doctor, with this potential threat to his long awaited visit.

"What I want to know, Hurley," said Jacob, shaking the wooden *totenpferd* vigorously at the screen, "is why no one thought of this sooner!"

"Jacob, they—"

"Why did they let me get this far just to throw up another barrier?"

"Jacob, please. I know it's difficult, but your people on Xenos cleared you. They thought since you grew up on Earth, you would have retained the normal immunities you developed in childhood and there would be no danger in letting you return. We've been over all this before, the first time you

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became ill. It's the reason you were allowed to come but your wife and children had to stay behind. They had spent too much of their lives on Xenos. Your people cleared you and we naturally assumed—"

"You should have had an independent procedure. My people were wrong."

"Look, Jacob, Xenos is our first experience with this kind of thing. It's the first colony to be completely out of physical contact with Earth for almost a generation. I'm sure in the future there will be procedures—"

"That doesn't help me."

". . . And we don't know your people were wrong yet, Jacob."

Jacob turned back to his open suitcase and continued packing, positioning the wooden horse among his clothes to avoid any chance of its breaking, but left the visiphone on. When he spoke, his voice was soft but with a definite edge of controlled anger.

"Don't we, Doctor."

"Not until the tests are completed."

"If you're so sure I'll pass your tests, Doctor, how do you explain the fact that I've had every Earthbound disease in the book since I came in contact with this crew? Anything they'd been exposed to, I got."

"If you're so sure you'll flunk—" said Dr. Hurley. He paused for a moment and Jacob looked up at the screen to see the cause of the interruption. The blue sleeved arm of an Earth shuttle crewman was handing Dr. Hurley a manifest which he glanced over briefly, signed and returned to the hand extended into view of the visiphone. He looked up at Jacob. "If you're so sure you'll flunk, why are you packing?"

Jacob glanced down at the half-filled suitcase and his anger broke, his intense expression dissolving into a self-conscious smile.

"All right, so the tests are still out."

The doctor nodded.

"How about some coffee in the lounge?" asked Jacob.

"Why not the forward observation room?" suggested Dr. Hurley. "No one uses it while we're in orbit and you get an excellent view of Earth." The doctor reached toward the screen as if preparing to touch it off, then looked up at Jacob. "I'll bring the coffee."

"I may just stay on this ship," said Jacob, "with service like that."

Dr. Hurley said nothing, his face blank as if the appropriately glib response had been edited somewhere between the sickbay and the screen in Jacob's cabin.

"A half hour, then," said the doctor at last.

"Fine," answered Jacob and the screen went blank.

The Earth, its dark side below them as they sat in the contour chairs of the dimly lit observation

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room, seemed to hang just outside the observation port, more like an ebony marble suspended in some thick transparent liquid than a planet in space. Occasionally a red spark became visible and grew as a shuttle cut up through the atmosphere to service either their ship or one of the others Jacob knew were in orbit. The coffee cup in his hand was still warm.

"I didn't start missing it until I was about twenty," Jacob was saying. "Even then I didn't miss it much. I had my studies. But after Barbara and I were married and Jimmy was born, I started looking at Xenos. It isn't a place to raise children."

"One place is as good as another," said Dr. Hurley, his face heavily shadowed in the dim light. "To them it's home. Earth would probably be as strange to them as Xenos was when you first arrived there with your parents."

"I don't think so. I've tried to teach them about Earth, its history and heritage. They would know more about it than I did about Xenos."

"Ancient Greece."

"Pardon me?"

"It's Ancient Greece to them," said Dr. Hurley, without looking away from Earth. A thin slice of reflected sunlight was appearing on one edge of the planet as the ship caught up with dawn somewhere on Earth. "Something to be admired, even honored on proper occasions, but it's not life for them."

Jacob looked past Earth, as if better to compare it in his mind with Xenos, his children's world.

"Perhaps you're right, Doctor."

They were silent a few minutes, each sipping his coffee and following his own thoughts. Finally Dr. Hurley gestured at Earth with his coffee cup.

"Who do you know down there, Jacob?"

"My sister. She stayed behind with her husband."

"Anyone else?"

"The people I went to school with."

"Have they changed as much as you have?"

"I suppose so. I can't really say. If you're trying to soften the blow, that isn't the way to do it. I didn't really come to see friends."

The doctor continued looking at the Earth, now a quarter-Earth with distinguishable features beginning to show. Jacob recognized Suez and Saudi Arabia, comparing them with the maps he had studied before the trip.

"Why did you come, Jacob?"

Jacob thought a moment before answering.

"I'm an Earthman and I had to know Earth once as an adult. What I am has developed here over the last million years. It's the only planet in the universe where a naked man can stand on the soil and feel at home."

"I've known men from a dozen

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worlds who felt at home off Earth."

"But I'll never," said Jacob before sipping the last of his coffee.

The doctor smiled. "No, I suppose not. What do you do on Xenos?"

"Echo team."

"Do you like it?"

"Sure, most of the time. I'm outside a lot, mapping the ecological systems of an area before a community moves in. The only part of it that's dull is converting our data into a usufructuary scheme."

"A what?"

"Regulations on land use to keep the balance. Did you see that carving I'm taking to my sister? It's a good example."

"The horse?"

Jacob nodded. "It's sort of the jackal of Xenos. When the colony was first set up, they tried to wipe out the *totenpferd* as a menace to human existence, or to domesticate it. The result was a plague of Xenosian rabbits, little two-legged creatures that can run as fast as a *totenpferd* but not quite as far. What we wound up doing was innoculating everyone with *totenpferd* poison in small dosages until they built up a tolerance. We had to adapt the people to the planet, not the other way around."

"I'm sure that didn't make the horses harmless," said Dr. Hurley.

"No, not harmless, but not lethal either, and the balance was maintained. Anyway, that's what I do. It takes several years to map an area properly."

"A frontiersman."

"In a way."

The doctor stood up, crushing his cup and dropping it into a chute next to the observation chair.

"I'll let you know," said Dr. Hurley, nodding toward the Earth, "when they send up the results."

"Thank you."

Dr. Hurley left and Jacob sat alone for a while, watching the Earth. When he finally rose, the planet was completely in sunlight. He could make out Africa below, though he could distinguish none of its tribally balkanized nations. It was simply Earth, man's home, but perhaps not his. Had Xenos been below him, he would have seen the variety and diversity of human life in his mind's eye, superimposed on the planet: The upland settlements with their hardy mountain men; the Xenos City population, a city that would only be a backwater town on Earth but was the only city on Xenos; a backwater world—all of the subtle differences that had developed in the planet's twenty-year human history in spite of the homogeneous nature of the original group, differences that would probably be as indistinguishable to Dr. Hurley as the nations of Africa were to Jacob. But it was Earth below him and the gift of its past to Xenos was the reason he had come.

Several hours later, after the

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purser made a general visiphone call to inform all passengers that the first personnel boat had lifted off from Earth and that they were to report to the transfer lock, Jacob went instead to sickbay.

Dr. Hurley was at his desk, reading a report which he held up by one corner when Jacob entered to indicate that it was the laboratory analysis they had requested. Jacob paid no attention to it, but scrutinized Dr. Hurley's face instead. It was impossible to interpret the doctor's impassive expression.

"Sit down, Jacob."

Jacob sat down in the chair next to Dr. Hurley's desk.

"Is it yes or no?"

"Let me tell you about the report first."

"Just tell me whether I should finish packing or not. We can talk about the report after that."

"I can't tell you that," said Dr. Hurley, his expression more like that of the Dr. Hurley who had first treated Jacob than the friend he had come to know on the trip. "The decision is yours. All I can do is give you the information to base it on."

Jacob gave an exasperated smile and pointed assertively at the report on Dr. Hurley's desk.

"You know perfectly well that what's in that report and what you tell me will control my decision. You can't push it off onto me. I made a decision to go to Earth over a year ago."

"It isn't that simple," said Dr. Hurley, still with the same professional impassivity. "And I'm not trying to evade any responsibility. The report says that the immunities you developed as a child are either gone or minimal. According to the blood tests, the reason for it is the immunities you developed on Xenos, both natural and induced. They were antithetical to the immunities you brought from Earth. In order to survive on Xenos—and you did survive—your system had to make a choice of sorts. Were you sick much when you first arrived there?"

"Almost constantly for the first year or so. Everyone was."

"Did anyone die?"

"Some did. Older people mostly. My parents."

"Their systems couldn't adjust," said Dr. Hurley, "Yours did."

"So that's that," said Jacob. "I stay on the ship."

Jacob felt none of the relief he had expected. They had the answers they had waited for, but somehow Dr. Hurley's presentation had no ring of finality to it.

"Not exactly, Jacob. If you went down to the surface and started playing tourist, I can almost guarantee you would be dead within a month. I can't say of what, but it would happen. On the other hand, there are drugs, immunizations, that sort of thing. After a series of treatments and careful observation,

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your natural immunities would develop. You were born on Earth, so the diseases you would be exposed to would not be completely hostile."

"And Xenos?"

"As you said yourself, the older people died. That might not happen in your case, but we don't know."

Jacob glanced down at the report, then back up at Dr. Hurley. To see Earth again and walk on it had been a dream that had grown over the years, grown until Jacob decided he had to go before he was too old. When he was told Barbara and the children must stay behind, he considered calling it off, but Barbara, knowing what Earth meant to him, had convinced him to go. At last Jacob smiled. There wasn't really any decision to make.

"I hope you haven't taken on any new crewmen."

"Why?"

"I think I've had everything this crew brought with them. I'd rather not be sick when I get back to Xenos."

"I'll tell the purser," said Dr. Hurley.

A week later the big ship broke orbit and headed away from the sun, preparing to shift into hyperspace. Jacob and Dr. Hurley, whose duties during this part of a journey were minimal, stood at a viewport, looking back toward Earth. The moon was out of sight behind it and they were unable to see the sun from where they stood. The Earth hung in space as if alone, obscured by cloud cover on its light side and with its continents hidden, seeming like any of a thousand anonymous worlds.

Jacob's first feelings of disappointment had passed, but as he made arrangements to send the carving and manuscript down without him, he noticed that he still felt the tension he associated with waiting for the laboratory analysis, as if something were still unresolved. He thought of the call he had made to his sister that had died out after five minutes for lack of anything to say, and the fact that she had failed to recognize him when she answered. Yet that wasn't the source of his uneasiness. It was something about himself, something he was unable to put his finger on.

"I suppose the choice was made before I left Xenos," said Jacob quite casually.

Dr. Hurley was quiet several seconds before he responded.

"If it's any consolation, Jacob, I sent in a report on what happened with recommendations for back up procedures to catch this kind of thing."

Jacob was silent, examining himself for any feelings of regret, or loss, as he watched the clouded planet recede. The ship's bulkhead trembled slightly as the hyperspace drive locked in phase. Outside the viewport, the Earth began to fade. As it disappeared, Jacob thought of

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his wife and family, of his work and the new area of Xenos he would begin mapping when he returned, of Xenos itself, not only his children's world, but his own. He wondered whether there was one day at sometime during the past seventeen years when he had ceased to be an Earthman in anything but spirit. He turned from the empty viewport to Dr. Hurley.

"Ancient Greece, Doctor."

"Pardon me?"

"Nothing. How about some coffee? I have to get my fill before I get home." ■

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by JAMES VANDIVER

With the wide variety of fields of research covered by Analog's readers, some of you should be able to come up with useful answers to these real, here-and-now problems.

THE SCIENTIFIC GAP IN LAW ENFORCEMENT

Law enforcement is, to some degree, dependent upon practically every type of craft, trade or profession. Oftentimes the policeman merely brings different specializations to bear on solving a crime. This requires a generalized knowledge of numerous specializations.

While generalization provides opportunity to pick up some useful techniques from various professions, it doesn't allow for their full development. For instance, ninhydrin reagent is used to determine pregnancy. Ten years ago it was also found to develop prints by reacting with amino acids present in the residue.

Other reagents should have been tested, but weren't because of the lack of knowledge. Even the overworked criminalists—not criminologists—in crime labs aren't true specialists in the sense of working, say, entirely within one area of chemistry, metallurgy, or dermatology.

While the policeman's specialized knowledge is limited, yours may not be. If you knew what had been done and what was needed, you might be able to simplify, or update, techniques, resolve problems, or develop revolutionary approaches. Your contributions can be more useful than any amount of public indignation over high crime rates.

C. H. Schafer already contributed his help in the May '69 "Brass Tacks" section. His letter mentioned the incident of one person's deposit slips being placed on tables

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in a bank where depositors used them. The magnetic account numbers on the slips caused the deposits to end up in the offender's account. This knowledge has helped several investigators in their understanding of how such magnetic numbers may be misused.

Let's concentrate on the problem of getting fingerprints, just crime scene ones, not the classification or taking of inked prints. Fingerprints were proposed as a positive means of identification ninety years ago. Since then only a small number of processing and preservation techniques have been developed.

These prints are loosely grouped into three categories: visible, plastic, and latents. Visible, or contaminated prints, are left by a hand—or foot—covered with paint, blood, dirt, or the like. Plastic prints are left in soft materials like putty, wax, butter, dust, or dirt. Latents, by definition, are invisible, but the body oils and perspiration that make them can often be seen, particularly on nonporous surfaces.

Visible prints are photographed and the object bearing them collected. The part bearing the print can be removed, if the object is too bulky, or immovable. This practice is avoided, if possible, since it often involves damaging expensive items.

Plastic prints are also photographed. If the object can't be taken and preserved, a cast is made of the impression with silicon rubber, or other casting material.

Latent prints generally include all prints which can't be photographed without additional processing to make them more visible. Most crime scene prints are latents, and this is where the most techniques have been produced, relatively speaking. This is also where the most problems occur and the largest amount of specialized knowledge is needed.

Finely divided powders brushed, or blown, over fresh prints on fairly smooth surfaces is a major means of making latents visible. Rub a finger across your forehead and press it gently onto a piece of smooth, white paper. Then crush about a half cigarette's worth of ash into fine powder and drop it beside the print. Shift the paper back and forth so the powder flows over the area you touched and you'll see a pattern of lines emerge, friction ridges.

Cigar and cigarette ash have been used several times to process prints, but only when commercial powders weren't available. Yet, this could be the lead to an ideal pow-

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der that no one has thought to check out. Have you any ideas as to which ash, or ashes, might be most useful?

Most present fingerprint powders are similar to their prototypes. A dark and a light powder are most often used. Gray, silver or white, and black are typical. They seem to provide the best contrast in the widest number of applications.

Chemist's Gray, a mixture of chalk and mercury, is still used as are lampblack and aluminum dust. A few unusual products have seen prolonged use, too. Dragon's blood is one. It's a brown resin from the rattan palm that's used in varnishes. Rosin is another. Both of these are supposed to be good powders. As with ashes, no further investigation of resins has been made. To whom would you go for information on such a subject?

Only some fifty substances have ever been used, singly, or in mixtures, to form fingerprint powders. They include the previous ones, plus various types of carbon, talcs, kaolin, sulphur, gold and aluminum bronzes, powdered zinc, iron and platinum, feldspar, lead carbonate—on fruit skins, incidentally—calcium sulphates, magnetic iron oxide, mercury salts, manganese and titanium dioxides.

Pigments and phosphors have been suggested as good possibilities, but controlled testing using standardize materials just hasn't been done with any materials. In other words everything has been pretty much trial and error up to now.

The only powders recently reported include yellow lycopodium spores, Xerox toner, and fluortec fluorescent powder. As with other materials, the quality of lycopodium spores hasn't been thoroughly tested. Conversely it's the only spore that *has* been used. Do other spores or plant materials, such as the resins and ashes, offer any possibilities?

Xerox toner is interesting from another standpoint. Prints developed on paper can be set, or fused, with heat. If prints could be easily fused on other materials, a developed print could be left on the object with little possibility of erasure. Resins may have some value here, too, since they are also fusible. And how about powdered Wood's metal?

Another problem is how to fuse a print at a crime scene without the use of bulky, heavy and expensive equipment. An investigator, or technician, already has a great deal of equipment to pack around, and oftentimes he's the only one around to do the packing.

Fluortec is a powdered polymeric substance with a fluorescent coloring material added. It's of use on multicolored backgrounds, such as the labels on food and beverage cans. Photography under ultraviolet light then produces a print that doesn't blend with its background.

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The main problem here is finding a material that fluoresces brilliantly, that adheres well to prints, and doesn't leave background traces of powder, which give a fluorescing print a fuzzy appearance.

The combination of a fluorescing material with a regular fingerprint powder produces a dual use material that works as a normal powder, and also on multicolored surfaces. Little information is available on the few times this has been tried. Another possibility is the combination of the fluorescing material with a fusible powder like Xerox toner.

If a multiple use, or universal powder, could be developed, it would be of considerable value. One problem many police officers have, even those with a few years experience, is determining which of some fifteen colors and seven or eight name brands to use. Once there was even a perfumed powder on the market. One or two universal and outstanding powders would save time and money for police departments.

Any fingerprint powder should stick only to the residue left by friction ridges and once stuck should be difficult to dislodge. It should contrast with the background bearing the print, not absorb moisture, be inexpensive and nontoxic, and show up well in black and white photographs.

Three categories of variables produce the biggest obstacles to the ideal solution of a universal powder. One is the variable condition of friction ridges. Wear and tear, age and inherited characteristics contribute to the physical condition of their structure, even to the extent of Fig. 1—as compared with Fig. 2. The length of contact with a surface, pressure and movement during contact also have an effect. The secretions used to make latent impressions also vary—with age, level of excitement, intoxicant consumption, climate, health and diet.

About ninety-eight percent of perspiration is water. The remaining amount contains fatty acids, urea, sodium and potassium chlorides, phosphates, carbonates, sulphates, formic acid, acetic acid, butyric acid, vitamin E, ammonia, creatinine and an occasional trace of albumin. Some toxic materials are also secreted, such as barbiturates, quinine and nicotine. (A powder that also produced a color reaction when, say, narcotics are present in the print material would be quite useful.)

Sebum, or body oil, produced by the hairy parts of the body is often picked up by the hands and becomes part of a latent print. Sebum contains fatty acids, two-thirds of which are unsaturated; combined fatty acids as glycerides, waxes, and other esters; unsaponified matter, squalene, and vitamin E again. The fatty acids and unsaponified matter make up ninety-five percent of the oil. Most of these compounds are

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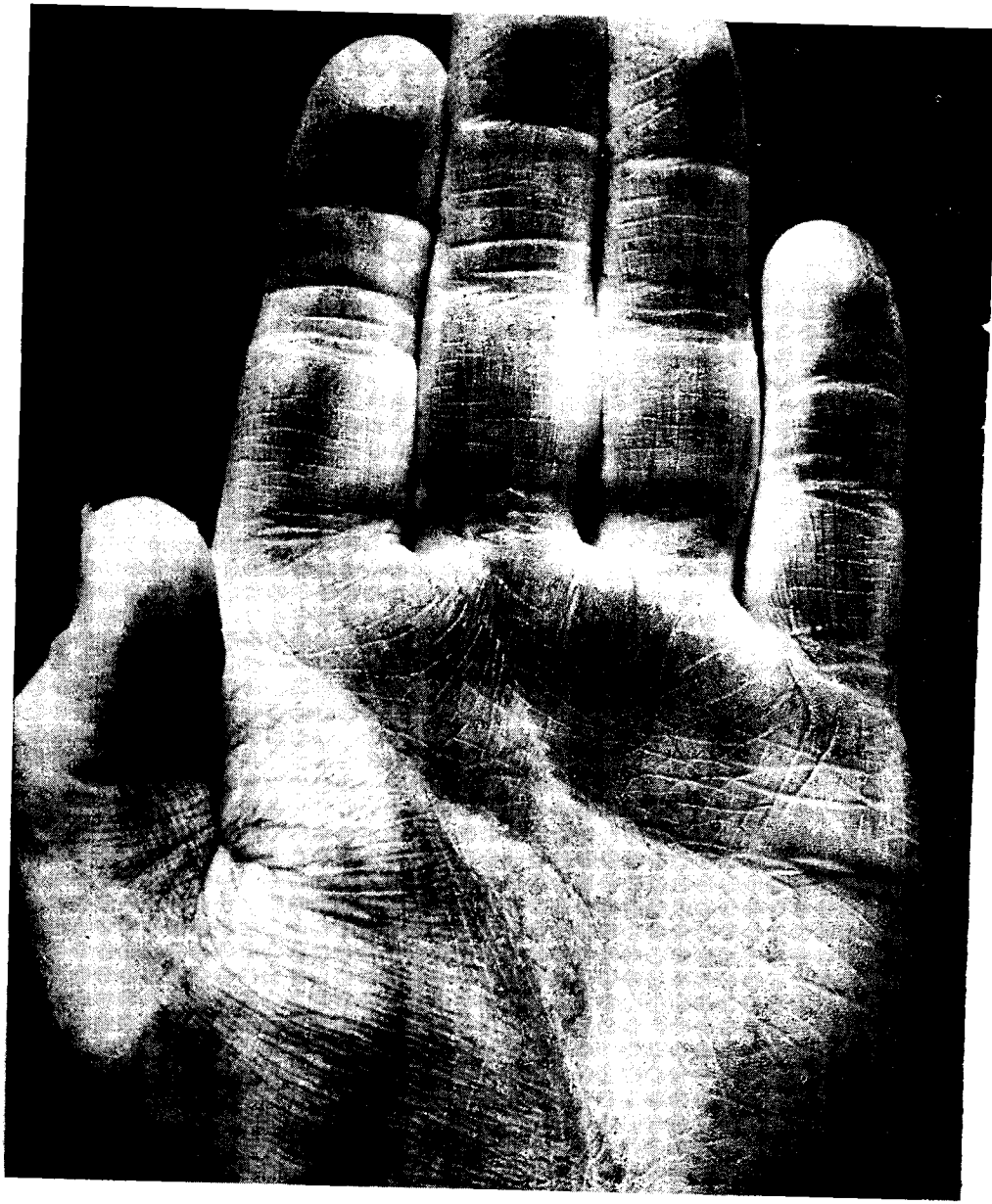

Fig 1. Some people don't have friction ridges, or they at least don't appear on the hands.

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George R. Christopherson

Fig 2. The use of fingerprints as a means of identification requires the presence of friction ridges.

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quick-drying and have little effect on the adhesiveness of latent prints, but they are of considerable importance when chemical processing is used.

The second category consists of variable climatic conditions. A powder which clings well to new, sweaty prints may not work at all, if the print has been exposed to the sun, wind, rain, or dust for thirty minutes. Even good prints that are well protected will surprise a fingerprint technician, if they can be developed without considerable effort after several days have passed. This drying of prints is one of the reasons prints are often processed at the crime scene by laymen rather than sent to a distant crime lab, and oftentimes such a lab *is* distant. Of course, the fragileness of latents is a consideration, too, where objects bearing them may be sent. This is one of those areas where fusible powders would be useful.

The third variable concerns surfaces that bear prints. Prints have been developed with powders on rough paper, finished wood, plastic, metals, painted surfaces, oily surfaces and waxed ones. No present powder works well on all of these, though, and very little has been reported as to which ones work well on what surfaces.

Another problem with the print-bearing surfaces is their damage by powders. Aluminum dust, for example, is impossible to remove from grainy surfaces, such as dark wood paneling. Most powders will also discolor finished marble. Materials such as rugs and fabrics can also be damaged, if powders spill over from working areas. This is a frequent problem, too.

No solutions to such damage have been produced even though they would have great public relations value. During an investigation it's a rather poor advertisement for law enforcement, if the police cause more damage than the offender.*

So, is there a powder that will develop varied prints on varied surfaces, under different climatic conditions without leaving an objectional background to affect the contrast of the developed print, or the material bearing it? A great many investigators will be indebted to you, if you find one.

Once selected, the powder must be applied. Manual or motor driven atomizers, and aerosols are available, but few police use them. You end up having to brush what's been squirted anyway.

A smoking technique is sometimes used and seems very effective. Burning camphor, pine knots, candles, or masking tape produces a black smoke that's actually a very fine powder. Burning magnesium does the same, producing a white

* How about a powder which sublines slowly, like moth balls? No matter how it looks now—in three days it will have evaporated! Or one which is unstable when exposed to air, and vanishes in a week? Ed.

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smoke. Unfortunately the residue still requires brushing.

Smoking an object is more difficult than spraying with an atomizer, or aerosol, yet it's preferred because the powder it produces works better—for some reason. Perhaps other materials would burn better or easier. Maybe a blower device would help, instead of holding objects over the burning material. Aren't there substances, like phosphorus, that produce such smoke merely by contact with air or other compounds?

It's odd that magnesium oxide has never been tried as a powder other than by burning the metal. But, again the idea was presented, sort of a pilot model, and left at that.

Brushes were the main means of applying powders and still are. The first ones were camel's hair or feathers. The softest camel hair is used. It's produced in all shapes and sizes to cover large or small areas, and to suit personal preferences. Feather, or down, brushes are still used, but their cottontail shape is difficult to use in confined areas.

About ten years ago two new brushes were developed specifically for fingerprint work. One is the Zephyr brush, made of over a thousand fiber bundles, each containing over a hundred glass filaments. The filaments are much thinner than camel hair, easier to clean and more durable. However, it's too limber for use on vertical surfaces and its flat contact surface obstructs your view of the working area. (The camel hair brushes usually have rounded or pointed tips.)

The second type is called the Magna brush, a pencil-sized tube with one end sealed, containing a magnet on the end of a six-inch rod. When the rod is depressed a magnetic powder clings to the sealed end forming a sphere-shaped brush, three-quarters to one inch in diameter. Retracting the rod allows the powder to drop back into its container.

A brush made of powder is perhaps the softest available. It also eliminates the need for several brushes to prevent mixing of different colored powders. Of course, problems occur when you try to dust a steel desk top, file cabinet or car door.

As with powders each brush just scratches the surface of possibilities within its category. Camel hair brushes come from art supply houses. Other types of hair, or fur brushes, might not perform as well in art circles as camel hair, but outperform everything else in developing prints. Where would you even begin to find out information on such a subject?

Storage and preservation, cleaning and use detract from the use of the feather dusters. A more compact method of mounting the down would be a great improvement. The feather duster is much more forgiv-

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ing of the inept than the camel hair brush, because of its softness. It seems to be as good as the Zephyr, or camel hair brushes, and possibly the Magna brush. It's simply too big and hard to use and care for.

Perhaps those who swear by the Magna brush are really only attesting to the type of powder it uses. Then too, some different or variable and possibly stronger magnetic fields might produce even better results. But there just aren't many cops around with training in the use of magnets. An electromagnetic brush is available, but a power source reduces its versatility.

Besides the problem of iron attraction by the magnet and well used powders, the powders also tend to clump into BB-sized nodules after about six months use, depending on the climate. Diligent use of a hammer will repowder them, but this is still a problem unshared by other powders.

So far only five powders have been developed for use with such brushes: red, black, and three shades of gray. A simple solution may be to add powdered iron to other powders. However the requirements of a good powder must still be met.

If any of these brushes is superior to the others it hasn't been proven, but they all do share one fault. They all work poorly upside down, or on vertical surfaces. If electrostatics could be adapted to the application of fingerprint powders, or as brushes, the "upside down factor" might be corrected. Any takers here?

Many times developed prints cannot be photographed, nor the object collected. Sometimes this inability is simply because no camera is available, or no qualified operator is available. Whatever the numerous reasons, prints are often lifted with transparent or opaque lifters.

Transparent lifters are good quality cellophane tape in varied widths. Opaque lifters are glamorized inner tube patches! The adhesive sides of both materials pick up the powders that adhere to the fingerprint pattern.

Transparent lifters are mounted on frosted, or clear, plastic backing. Black or white photographic paper also works well as a backing material. Opaque lifters are merely protected with clear plastic covers. Black and white ones are used for contrast purposes. These lifters are difficult to use on irregular surfaces and they trap air which leaves blank spots in the lifted print.

A plastic spray that dries quick and clear, and adheres only slightly to any material-bearing prints, such as unfinished wood, smooth leather, other plastics and paint, would be a real boon. The U.S. Army developed a nylon spray in the early '60's which was found to lift prints, but its intended use was

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discontinued and no further tests were made. Our more sophisticated technology should now be able to produce an even better product, shouldn't it?

Ten or eleven chemical processes are used to process prints. These are usually applied in the laboratory. Bromine and chlorine vapors are used, benzidine and leuco malachite tests for blood on bloody prints, ruthenium tetroxide, ozmic acid fumes, hydrofluoric acid vapors with prints on glass and stone, copper carbonate in ammonium hydroxide on prints etched in brass, and electrolysis with prints on greasy tools.

Iodine fumes, silver nitrate and ninhydrin solutions or sprays are the most prevalent. Ninhydrin, the most recent, may replace all other chemical tests, so good are its results. Thirty-year-old prints on porous material have been developed with this medical reagent, compared with the two- or three-year limits of other processes. However, only one color, a lavender or pink, is produced which doesn't provide the needed contrast in all cases.

Chemical developers are most often used on porous materials, such as cloth, wood and paper. Of these three paper is the biggest contributor. Chemicals in solution have the primary advantage of reacting with prints to which powders will not adhere. Their disadvantages include short shelf life, toxicity, corrosiveness, lengthy reaction time and complicated application procedures.

Several interesting possibilities are apparent with chemical developers. The first, most obvious one, is how many other ninhydrin type reagents or tests are possible? Esbach's reagent, for example, is used to test for albumin in urine. Will it work on the albumin in prints? Thudichum's test is used to detect creatinine. Creatinine is also found in print residue. And what of that earlier mentioned possibility, the detection of narcotics, or barbiturates, in print residue?

Another technique involves the use of dyes. In some cases ink can be brushed over a porous material bearing prints and only the area around the prints will absorb it. This has limited application, of course, if you don't want to damage the material, such as a document.

Oily prints have been dusted with albumin and stained with coal tar dyes similar to bacterial dying. Azo dyes, such as scarlet red, stain fats. Will azo dyes or other dyes work on prints? Again, it just hasn't been tried, nor the other ideas exploited.

Also intriguing are the possibilities of dusting for prints with powdered chemicals such as silver chloride. The print can be developed by both the adherence of the

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powder, which is one color, or by exposing the powder and print to sunlight to produce a contrasting color. Or, a mixture of one part powdered iodine to two parts chalk that produces an initially light colored print, which rapidly darkens.

If this idea was merged with the triple use fingerprint powders, and the drug indicator, an extremely potent universal print developer would be the result. Such a powder could be fusible, fluoresce, detect drugs, be applicable with a regular brush or Magna brush, and develop a print mechanically as well as chemically.

For chemical use it should be soluble in water or alcohol for use on prints which are too dry for adhesion to be effective. Then all you'd have to do is dust a surface and if no prints were developed, just spray it with a mist of water or alcohol to produce your solution. Ideally the reaction should be quick, not dependent on the application of heat or special lights, and long lasting, but reversible to restore material to its original condition.

If you have ideas about any of the problems or processes presented here, please pass them on in one of the police magazines listed at the end. They get very few articles from "civilians," but those that have been presented are invariably interesting and helpful. You could write about the types of organic, mineral, or other powders that are available and from where. You could theorize about the qualities of the ideal powder, or about adhesion, mass, particle size, and colors. Or any of the other areas that are barely explored.

If you have a useful item, or produce one, and you'd like to get it to the police, several law enforcement supply houses are also listed, which accumulate such supplies from many sources.

Your help could well mean that the lawless element of our society does not surpass the police in technical competency!

The Police Journal: Butterworth and Co. Ltd., 14 Curity Avenue, Toronto 16, Canada.

Police: Charles C. Thomas, 301-327 East Lawrence Avenue, Springfield, Illinois 62703.

The Police Chief: International Association of Chiefs of Police, 1319 18th Street, NW, Washington, D.C. 20036.

International Criminal Police Review: General Secretariat, 26 Rue Armengaud, 92 Saint-Cloud, France.

The Journal of Criminal Law, Criminology and Police Science: Williams and Wilkins Co., 428 E. Preston Street, Baltimore, Maryland 21202.

MP Journal: Box 7500, Fort Gordon, Georgia 30905.

George F. Cake Corp., P.O. Box 29263, Atlanta, Georgia 30329.

F. Morton Pitt Co., 1444 So. San Gabriel Blvd., San Gabriel, CA 91776.

Sirchie Finger Print Labs, Moorestown, New Jersey 08057.

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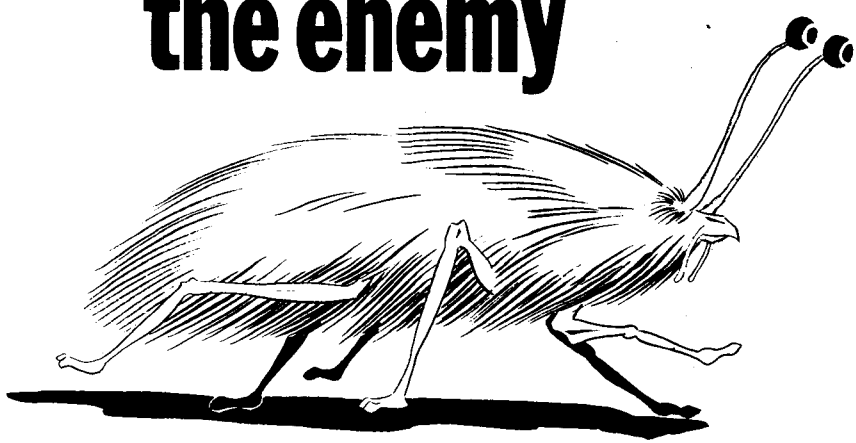
the enemy



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The greatest danger from aliens is that we haven't evolved with them—and haven't evolved defenses against their special attack methods!

M. R. ANVER

Illustrated by David Cook

Faon felt like his right side had been pounded with a hammer. Pain began in his head, a dull throbbing ache, and progressed down his shoulder to his wrist where his slightest movement produced searing jabs of agony. He was lying with his right arm doubled under him, the Cadosian realized. He rolled over, flakes of snow dropping off an arching crest of green scales on top of his hairless skull, the most obvious remnant of reptilian ancestry in his otherwise humanoid race.

He found himself gazing at a murky twilight sky smeared with a bloody sunset. There was something incongruous about the sky, he decided, shivering in the penetrating cold. The color was right; Planet II's parent star, Signa, was a red dwarf. But he wondered why he could see it at all. He should have been inside . . .

Bracing back with his left arm, hand sinking into fine, powdery snow, Faon sat up stiffly. Snow was everywhere, coating his clothing, piled and drifted around the room. Room . . .

He looked around him, dazed. Opposite him was a huge, gaping hole where a wall used to be, above him, the roof seemingly blasted away. Debris was scattered throughout the room, furniture overturned, equipment smashed, a coating of broken glassware glittering through the snow on counter tops and floor.

Terran surprise attack. The sick realization, conditioned by five years of war, came instantaneously. But immediately another thought intruded. The Terran-Cadosian war was over, had been for almost a year . . . or did he dream that? No, wait . . . Despite his headache, Faon forced himself to concentrate. He was in the Comsearch Corporation's research station, Terran organization, Terran staff . . .

Faon blinked as his eyes accommodated to the dimming light. Less than half a meter away, in the

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midst of the disarray, a woman's body was sprawled face up across a table—Dr. Lise Parrin. The entire front of her white lab jacket was caked with dried blood which had spread underneath her head, staining her blond hair. Black crusted blood delineated a gash across her throat.

An autopsy knife lay on the floor beneath the table, centimeters away from the twisted figure of a man. The head and part of the upper torso were unrecognizable, a pulpy, pinkish congealed mass of half-cooked meat.

The Cadosian began to shiver violently. Holding his right arm against his chest, he crawled unsteadily to the man's body and touched one waxen hand. Cold, fingers locked in a rigid claw.

"What are you doing?"

The harsh whisper brought his head up with a snap. A tall, burly man, a stranger, was standing in the doorway, his eyes wide with horror, face ashen beneath a coppery tan. Faon stared at him blankly.

"*All* of them are dead." The man walked slowly toward him. "What happened?"

The question dumfounded Faon. He searched his mind desperately for facts. The research station had been intact, the Comsearch scientists moving around, a buzz of voices and activity, light and warmth, rich air which didn't burn his lungs. His gaze shifted back to the bodies. The contrast between normalcy and reality was too extreme. "I . . . don't know."

"When did it happen?"

The Cadosian shook his head, his pale eyes bleak. "I don't remember."

The man clenched his fists, then slowly dropped his hands to his sides. Without saying anything else, he helped Faon to his feet and steered him out of the room. As they began walking through the remnants of a corridor, a second person, a younger, dark-haired man joined them. He looked vaguely familiar but at the moment, Faon couldn't place him.

"*He's* the only survivor?"

"Yes."

"Oh, no . . . What happened?"

"He doesn't make any sense. Let's get him back to the ship."

"But what did he *say?*" the younger man demanded stridently as they left the wrecked station, plowing through ankle-deep snow toward a sleek, silver-black yacht.

Faon fought a wave of dizziness, but as movement returned circulation to numbed limbs, his head cleared. Suddenly, he knew the identity of both Terrans. The questioner was Terrill Evans, a Comsearch administrator and erstwhile scientist; the other man, Jel'Shtein, a minor bureaucrat in the Terran government. They had come to Signa II for an inspection tour.

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The eight Comsearch scientists had been waiting for them—

Something small and white scuttled across the snow in front of Faon. The men started, and Evans asked automatically, "What's that?"

The animal, a multi-legged tangle of white fuzz the size of a cat, halted a short distance away. Two eyestalks on its anterior end twirled to observe the group; after a brief hesitation, it came mincing toward them.

"An autochthonous species. Conventional endotherm," Faon volunteered. Speech came easier. "The Terrans kept this one around as a mascot."

Evans peered at Faon, his scowl becoming evident as they climbed a ramp into the lighted interior of the ship. "You're lucid enough now."

The Cadosian looked directly at both men. Melting snow streaked his face like tears but his colorless eyes were empty of grief, his expression set. "I'll try to answer your questions."

Evans's mouth set in a thin, hard line. "You're damned right you'll try."

Jel'Shtein cut in, "Wait—"

"What for?" Evans snarled, turning on him. "What qualifies *you* to give advice? Remember, you government boys crammed this whole asinine idea down our throats at Comsearch. Swords into plowshares, cooperate, trust each other, Terra and Cados are at peace. Well, we warned you from the beginning, don't say we didn't warn you. And now—" He choked on his words.

Jel'Shtein clamped a hand down on Evans's shoulder and propelled him a short distance down a corridor. "Stop it!" he commanded, taking an obvious tight hold on his own temper. "Go dial something hot for him to drink, get the medikit, and quit making accusations."

Evans struggled for a retort, then jerked free and stormed down the corridor. "He knew all of them . . . colleagues . . . friends," Jel'Shtein said almost to himself, watching Evans go. He indicated the direction of the lounge, and Faon followed without comment; once inside, the Cadosian sank down into a deep chair.

"How well did you know them?" Jel'Shtein continued.

"Six weeks is hardly time to form close associations, especially biracial ones, and I've been busy doing my preliminary survey of this planet's ecology."

"All right." Jel'Shtein began to pace around the room. "How do you explain those deaths?"

Faon touched fingertips to his right temple where a huge, greenish bruise was forming. He decided the Terrans were far more interested in affixing guilt than seeking explanations. His eyes became remote, unfocused. Their opinions aside, he still had no answers.

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"From an ecological standpoint, I can't explain them," he said finally.

"A sudden, violent storm?"

"No. Impossible with current weather conditions."

"An attack by an indigenous species?"

"No. There aren't any predators large enough to cause that kind of damage, and there are no sentient life forms on Signa II."

"What about an attack from offworld?" Evans sneered the suggestion from the doorway. He crossed the room to Faon and set a cup of soup down on a convenient table, his movements taut, but controlled. "It would only take a minor incident to abrogate the Regin Peace Treaty, which Cados almost didn't ratify in the first place."

Faon passed the intimation for a moment; he was still cold and the soup looked inviting. He started to reach for the cup with his right hand but drew back, wincing involuntarily.

Jel'Shtein's eyes narrowed and he took the medikit from Evans. "What's wrong with your arm?"

"My wrist is broken, I think."

"How did that happen?"

A microsecond of frozen disbelief watching . . . what? The memory fragmented and vanished. "I'm not certain . . ."

Evans muttered an obscenity. 'Are you telling us you have a convenient case of amnesia?"

Faon said coldly, "No. I remember everything to a point. I was recording data at a laboratory desk, Benson was dissecting one of the facultative exotherms Comsearch is studying, Protopov was examining another live specimen, like George, which he found thirty kilometers from the station, the others were performing routine tasks while waiting for you."

"Who's George?" Jel'Shtein interrupted.

"The animal you saw earlier. It's been fed by the Terrans for a month. It probably came on board with us." Faon glanced behind him, located the animal in a corner. It crouched against a bulkhead, two limp orange sacs resembling a handlebar moustache hanging down on either side of its beaklike mouth. Its attention seemed to be riveted on the cup of soup. "Protopov's specimen was only the second one like this we've found to date," he added.

Evans waved one hand, an impatient dismissal. "Don't change the subject. You said everyone was waiting for us. What then?"

"Then . . ." The Cadosian looked down at his temporary cast already hardening from a spray-on catalyst Jel'Shtein had applied. Suddenly, the elusive, dreamlike image returned. "Someone came up in back of me. I turned around, saw one of the Comsearch men swinging a blunt object . . . a tool . . . like a club. I started to dodge . . ." He thought for another moment, then slowly ran a finger across the

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bruise on his forehead. "That's all."

Both Terrans gaped at him. Evans recovered first. "Are you claiming *they* attacked *you?*"

"I'm not 'claiming' anything." Faon paused reflectively and continued, "However, such an attack using mandatory defense supplies on hand—grenades, lasers—would correspond with the amount of damage. An attack from space . . . assuming there was a reason for one . . . would have left the station and surrounding area a fused slag heap."

"That's crazy!" Evans exploded. "It would have been the act of a madman—"

Faon shook his head slowly. "An individual couldn't have destroyed the station and occupants; the others would have organized to stop him. There had to be a collective madness—"

Evans flushed. "They were a stable group of scientists. You're the one that's insane—if you think we're going to believe your Cadosian lies."

"You just said you couldn't remember," Jel'Shtein agreed.

Faon stared at them expressionlessly. "If you don't choose to listen, give me an alternative explanation, not merely your own xenophobia and racial prejudice."

"I'd say those were good motives—for you," Evans grated.

"Certainly. I'm a demented killer, as are all Cadosians, a fact known by every Terran."

Jel'Shtein stirred uneasily. "Recriminations won't help."

"Nothing's going to help. It's over." Evans clipped off his words. "All that's left is for the Terran government to apply whitewash and cover up the whole incident. Or can you guarantee there will be a full-scale investigation?"

"You know the government is tied up with reconstruction, the only reason why a private corporation like Comsearch was funded for research on Signa II in the first place," Jel'Shtein retorted. "What do you expect?"

Evans shot a venomous glance at Faon. "To find out the truth."

"Your version of the truth," the Cadosian corrected. Evans took a threatening step toward him but Jel'Shtein interposed himself.

"Enough. Stop arguing, Evans, and get some sleep. We have to bury the bodies as soon as it gets light, then lift-off from the planet."

Evans's face twisted in a grimace of pain. His throat muscles worked for a moment; then he turned mutely and left the lounge.

Warmth, dry clothes, a comfortable bed though too soft for his tastes, an analgesic to deaden the ache in his head and wrist . . . but he still couldn't sleep. Faon sat up and dialed the lights in his quarters bright enough to reveal contours of furniture, a wardrobe, and white crests of waves in a seascape tri-D.

He contemplated the picture.

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Cados had so little surface water . . . he'd never done a survey on a planet with seas like that. He thought he might like to see them for himself—but on the other hand, scenery wasn't worth an overdose of Terrans.

He felt a returning flash of irritation. All the quarreling had prevented a real discussion of the problem: *Why* the deaths occurred. Without that knowledge, there was no way to be certain that he and/or the Terrans wouldn't somehow take the cause of insanity with them off planet, have the same senseless murders happen in deep space or on a populated world, spreading . . .

He cut off wild speculation. In the little time left on Signa II, he had to work with facts. Item: The Comsearch station had been a self-contained unit with its own food and water supply and atmosphere. Everyone usually wore respirators when working in the rarified outside air. Still, there had been ample exposure to the planet's microorganisms though preliminary tests indicated they were nonpathogenic.

A disease? Faon leaned back, his eyes fixed unseeingly on the seascape. It was possible, he supposed. A nervous system infection with a long incubation period to which humans were susceptible . . .

He shook his head, dissatisfied. Most biological agents didn't behave that way. Symptoms in a group of infected individuals occurred on the same day, or even within hours, but never in all members at a precise moment. Chemical warfare, on the other hand, produced exactly that effect.

He was reaching the same mental dead end as the Terrans, Faon thought with disgust. The war was *over*. There was no conceivable reason for any kind of attack—

But . . . there was a reason! The realization galvanized him. He stood up, his mind racing. He'd check out his idea with the ship's computer— No. He'd only get back, quite correctly, "Insignificant data to reach a conclusion." Also useless to talk to the Terrans about it. They'd believe he was trying to shift blame off himself with a totally implausible story. He had to confirm his theory with experimental evidence . . . and there was only one valid experiment to perform. A hazardous experiment, he knew, but necessary.

Selecting a parka from the wardrobe, he left the cabin and walked noiselessly to the galley, stopping long enough to fill his pockets before going outside into a cold, windless night.

The temperature had plummeted after sunset to its usual minus thirty-five degrees Centigrade, Faon noted, putting on his hood and one glove immediately, pushing the hand with its clumsy cast into a bulging pocket. He went quickly toward the station, a barely visible jagged ruin in the gray

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moonlight filtering through a heavy cloud cover. A hundred meters beyond the wreckage, the muted light glinted off the metal hull of a Comsearch skimmer. Faon made a wide detour around the station to reach it.

As he had hoped, the skimmer seemed undamaged. He turned on its landing lights, made a closer inspection; then, satisfied, climbed inside and carefully eased the craft off the snow. He flew the skimmer at low altitude away from the silent Terran ship, over scrubby evergreen plants and snow-covered boulders. The skimmer was easy to pilot on manual, even one-handed, but Faon switched the controls to automatic—the coordinates he wanted were preset—while he reached behind the seats. Fumbling through a pile of equipment, he selected a portable force-field grid a meter in diameter. He was examining the mechanism embedded in a central disk when the skimmer landed itself in a snowdrift on the edge of a small clearing.

Faon looked morosely at the uninhabited landscape. Experimental evidence if possible, he thought, carrying the grid across the clearing and dropping it in the snow. It sank slightly through the crust; he pushed it deeper, kicked loose snow on top of it, then knelt and brushed more snow over it until it was completely covered. Locating a concave platform above the central disk by feel, he emptied the contents of his pockets onto it. The items—a nauseously sweet substance the Terrans called chocolate, meat, and fruit—seemed to be resting on the surface of the snow.

Not an ideal setup but the best he could do, the Cadosian decided. He returned to the skimmer and activated the grid's sensors by remote control. All he could do now was hope that he could complete this phase before the Terrans discovered his absence and interpreted it as flight and therefore, proof of guilt.

Though he knew the sensors were far more accurate than his eyes, he watched the clearing for movement.

"Evans? Evans." Faon reassured himself that everything was prepared, then reached out and touched the sleeping man. Evans sat up suddenly, his drowsy surprise at seeing Faon in his quarters hardening into mistrust.

"What do you want?" His eyes traveled over Faon's parka, the respirator hanging around the Cadosian's neck. "Where are you going?"

"I want to show you something."

Evans asked truculently, "What?"

"A demonstration may be more instructive than a verbal explanation."

"What are you talking about?"

"In the lounge, please."

Evans ran his hands through his hair, then rose, shaking off sleep. "I

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don't know what kind of trick you're trying to pull . . ."

Faon didn't want to argue with him. He gestured toward the door and waited silently until Evans preceded him into the corridor. "Wake Jel'Shtein and ask him to go into the lounge, also," he said, moving away. "I'll be there in a minute." Disregarding Evans's audible comments about the Cadosian mentality he went to the galley.

As he entered, he heard a hollow *plop* followed by frantic scrabbling—sounds of George, the Terrans' mascot. The animal jumped off a counter top and dragged a slab of meat into a corner, its legs skidding in all directions on the slippery floor.

The humans used to call it to them, Faon remembered. Unable to bring himself to converse with it, he walked over and picked George up, tucking it under his injured arm. Preoccupied with a chunk of meat stuffed in its beaklike mouth, George offered no more resistance than waving several of its legs while Faon carried it. Just outside the lounge, the Cadosian put his good hand into a pocket, fingers curling around a palm-sized stunner, an item he was sure he'd be called on to explain if the experiment was unsuccessful.

He stepped into the room, leaving the door open, and both men turned toward him. Evans said curtly, "What now?"

"On the table." Faon motioned with his head toward a black specimen-carrying case. "Open it, please."

The Terrans exchanged glances. "Why the mystery?" Jel'Shtein queried. "What's the point of this?"

"I think you'll understand after you open the case." Noting their hesitation, Faon commented, "There certainly is no bomb in it."

Evans gave a derisive snort. He pulled the case's lid back and peered inside.

Faon felt George tense against his body. The meat fell, unnoticed, out of its mouth, and it began clawing the air with its legs, writhing in his grip. He loosened his hold, letting the animal drop to the floor. It began to dart across the room, eyestalks swiveling in all directions.

Evans's face darkened. *"That's* your big revelation? Who gives a damn if you found another one of those?" He dumped the specimen case on its side, spilling out an identical twin to George. The animal slid off the table and skittered underneath the nearest chair.

George shrieked piercingly. Its fur standing on end, it charged at the second animal. As it reached the chair, both orange sacs on either side of its mouth dilated hugely, then deflated. The second animal spun around like a dog chasing its tail. Recovering its balance, it shot toward the farthest corner of the lounge as if jet-propelled, with George in hot pursuit.

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Faon disregarded them. He placed the respirator over his face and half-crouched, the stunner out of his pocket now, aimed at the two men. They looked at him, astonished.

Evans began, "What the *hell*—", then staggered and groped for Jel'Shtein. The government man's eyes glazed. Abruptly, the Terrans were fighting, clawing at each other's throats. They came reeling toward Faon, and he jumped backwards, one foot coming down on a squirming animal running behind him.

He fell sideways and twisted at the last moment to avoid landing on his injured wrist. With the impact, the stunner squirted out of his grasp. It bounced across the floor; he made a frantic dive for it, recovering it as the men tripped over him. He felt Evans sprawl on top of him, but wriggled free. Jel'Shtein was regaining his feet a short distance away, time for a clear shot—

He fired, and the government man crumpled. Almost simultaneously, Evans's hands clamped around Faon's throat.

The Cadosian got his legs under him, rolled over. Evans went with him, hands locked. They slammed into furniture and Faon felt the respirator pull away from his face as Evans tightened his viselike hold, cutting off all air until Faon began to red out. With a final effort he dragged himself to his knees, reached back, and fired the stunner at close range.

Evans's hands slid off his neck, and Faon lurched forward. He gasped reflexively, filling his lungs. Sudden rage choked him, a blinding sunburst of fury, an icy core of terror in the mounting heat— He clutched desperately at his last coherent thought, shoot now, NOW . . .

"Faon . . . Faon, dammit, wake up . . ."

Faon pried his eyelids open, a major undertaking, and saw Evans's face waver into view.

"What's the matter with him?" Jel'Shtein inquired from somewhere out of Faon's field of vision.

". . . Not sure but I think . . . took a stunner charge close up, like I did. Is that right? Did you stun yourself?"

"I . . . must have . . ." The Cadosian sat up carefully. He waited until the room stopped revolving before he looked at the disheveled Terrans: ripped clothes, facial bruises evidence of their battle. He said slowly, "I was correct."

Evans shook his head in groggy comprehension. "You used us—"

"And myself, inadvertently."

"What makes you think we're your guinea pigs?"

"You wanted further investigation, didn't you? You just had it."

Jel'Shtein stared at them dully. "Maybe my brain's still numb.

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What are both of you talking about? Faon?"

"About the little animal, George. It caused the humans' deaths. Not because it attacked them—they fed it so it accepted them—but because as I've demonstrated, it attacked what it considered a real threat to its territory: another of its kind. Those sacs next to its mouth must actually be excretory glands like the anal sacs of a Terran skunk, or the wing spray of a Vegan syene. In this case, they represent a defense mechanism within the species, developed most probably as a result of food competition, a predominant factor of Signa II's ecology. Evidently, the excretion from the glands affects the Terran—and Cadosian—nervous system like a chemical warfare agent. It induces violent but temporary insanity." His eyes searched Evans'. "Do you agree?"

"I . . ." The Terran made a futile, helpless gesture with his hands, then dropped his head. "Yes. I guess you're right . . . but what a senseless way to die."

Faon nodded, a barely perceptible dip of his chin. "I'll be back shortly," he told them, standing up and putting on his respirator. "I'm going to find George and his enemy, and put them back out side where they belong."

"Do you need help?" Jel'Shtein asked.

"No." He took the edge off his answer with a tentative smile.

Evans glanced up, his face drawn, but no longer bitter. "Be careful, Faon." ■

IN TIMES TO COME *I could say a lot about the serial starting next issue—and the magnificent cover Kelly Freas has done for it—but the space available is limited.*

The story is "The World Menders," by Lloyd Biggle, Jr.— who writes too seldom, but turns out powerful yarns when he does. This one has to do with a Galactic civilization trying to help a planet whose highest culture is about Roman Empire level advance, without the natives knowing the Galactic Federation exists. Nothing new in that—except that Biggle does a phenomenal job of telling it. But Biggle's introduced a cultural problem that's never been attacked in science fiction before.

The culture has slaves. Under what conditions would it be cruelty to free slaves? For these slaves can not be freed! And it makes a bang-up think-piece for your consideration.

Kelly's cover is exceptional, even for him—and we'll be offering type-free copies to those who want them. Send $1.50—check or money order—to Analog, Dept. AC-9, P.O. Box 1348 Grand Central Station, New York, 10017 for a proof copy of the cover, without type, suitable for framing. These are proofs printed from the original plates on special quality paper—a quality of reproduction not practicable in quantity production printing.

And that Lloyd Biggle yarn is going to be one of the classics. THE EDITOR

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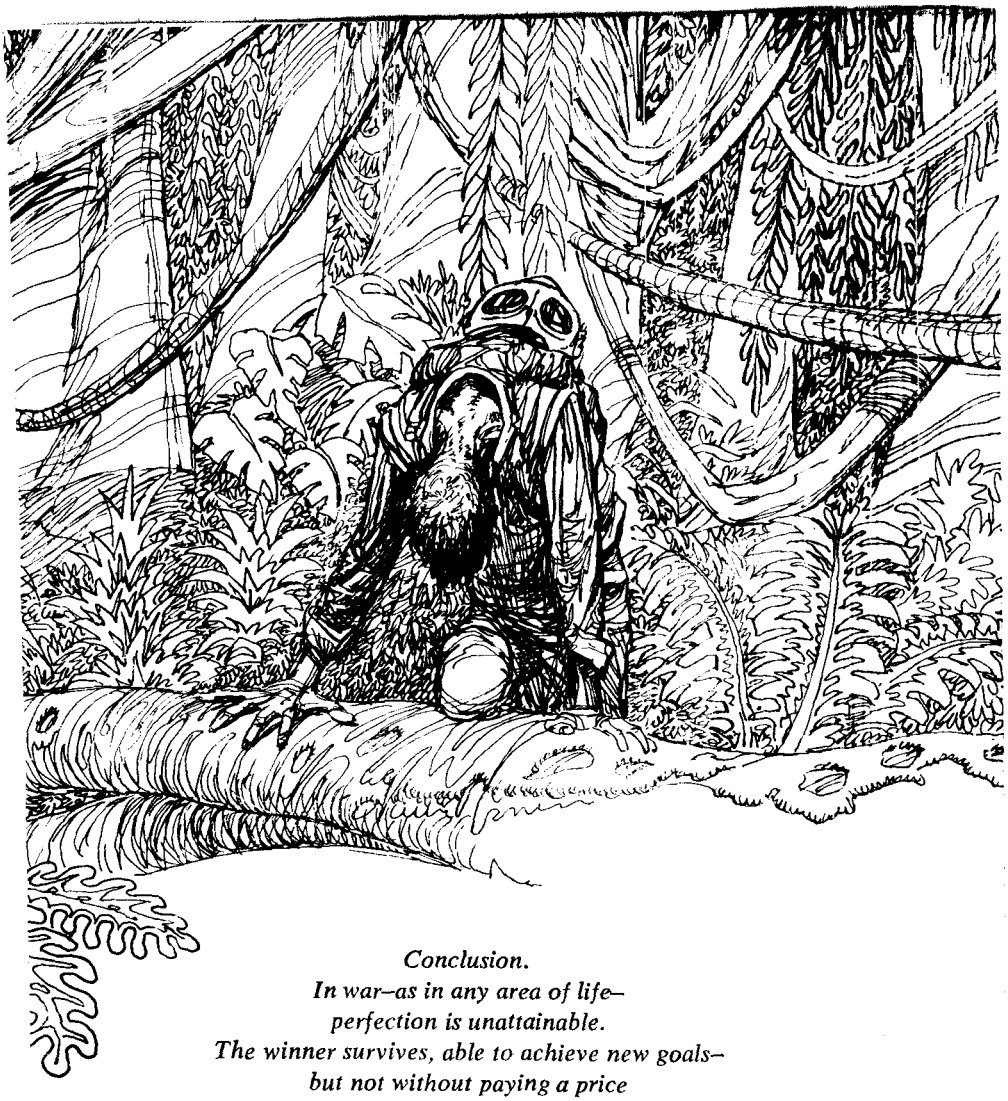

Conclusion.
In war–as in any area of life–
perfection is unattainable.
The winner survives, able to achieve new goals–
but not without paying a price
of that survival!

GORDON R. DICKSON

Illustrated by Kelly Freas

THE TACTICS OF MISTAKE

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SYNOPSIS

"The young lieutenant colonel was drunk, apparently, and determined to rush upon disaster . . ."

The lieutenant colonel in question is Cletus Grahame, an officer in the Western Alliance, an aggregate of former Earth nations who dispute control of that world with the Coalition—another former nation group. The rivalry of the Alliance and the Coalition has recently extended to colonized worlds off-Earth with the two Earth political giants backing opposing sides in inter-colony wars.

The scene of Cletus's apparent drunkenness is the dining room lounge of a civilian spaceship en route to the colony world of Kultis where the Alliance has an expeditionary force helping the Exotic colony of Bakhalla against the Coalition backed colony of Neuland. Cletus, limping on a half-prosthetic knee, sits down without invitation at the table of Dow de-Castries, Secretary to the Outworlds for the Coalition, also en route to Kultis.

At the table also are Eachan Khan, a full colonel in the Dorsai mercenaries, his daughter Melissa Khan, and an important Exotic named Mondar the Outbond, homeward bound to Bakhalla. Cletus reveals the fact that he was the former head of Tactics at the Alliance Academy. He initiates a duel of words with Dow and ends up engaging the Outworld secretary in a form of shell game with sugar cubes and coffee cups. Dow apparently wins, but his earlier attitude of cynical amusement at Cletus's actions suddenly changes. The secretary moves to stop and question Cletus—who is about to leave the table—and Melissa has to plead a headache to get Cletus away.

Outside the dining room however, Melissa warns Cletus to stay away from Dow. Also, from herself and her father, whom a wild theorist like himself can only endanger. Sadly, Cletus agrees.

Once landed at Bakhalla, however, Cletus proves his combat-abilities—in spite of the fact he is ruled out of duty as a field officer because of his knee—in saving Eachan, Melissa, Mondar and himself from an attack by Neulander guerrillas. He meets General Bat Traynor, his commanding officer and allows himself to be sent out to stem a new guerrilla infiltration with inadequate military force. The general, who had asked for jungle-breaker tanks and got Cletus instead, plainly hopes Cletus will make a mess of things, and can, therefore, be shipped back to Earth.

That night at a party at Mondar's Cletus reencounters Dow de-Castries and the two men acknowledge their enmity. Later, with Mondar, Cletus has a paranormal experience in which he and Mondar each seem one in a line of fig-

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ures stretching before and behind them. Behind Cletus is a man with one arm, and the last figure in his line is a powerful old man in Fourteenth Century Italian armor.

Mondar pleads with Cletus to become an Exotic and develop his obvious unusual mental and physical abilities. Cletus refuses. The next day he goes out to capture the guerrilla infiltrators, and talks the field officer supplied him—a sullen, hypersensitive first lieutenant named Bill Athyer—into taking most of the troops to guard two river crossings. Cletus, given only seven men to guard three other crossings, actually intercepts and captures half the guerrilla force, turning the other half back on Athyer. However, in doing so, his bad knee is injured, and he must spend several days in the hospital.

Coming out of the hospital several days later, he finds himself now in good reputation since his capture of half the infiltrators. (Athyer has let his half escape, after all. Bat, on Cletus's intercession and advice, transfers Athyer to become liaison officer at the Exotic library in Bakhalla, rather than court-martialing him.) Cletus asks to set up an office for making future estimates of enemy activity; and Bat is in no position to refuse. Accordingly, with Arvid Johnson's help, Cletus sets up the office, booby-trapping it to catch and hold anyone investigating the office after hours.

The loss of the infiltrators have put the Neulanders in the position of coming up with some other military success to celebrate the visit of Dow. Without authority Cletus sets up a further trap for guerrilla saboteurs and supplies coming into Bakhalla down the main river channel—with the help of an underwater bulldozer in the hands of a navy officer on harbor duty at Bakhalla.

They capture a surprising number of infiltrators and supplies and return in triumph to Bakhalla; where, meanwhile, Cletus has talked Colonel Eachan Khan into training his Dorsai mercenaries as jump troops.

The next day Bat Traynor calls Cletus into his office and explodes about the unauthorized expedition after the river infiltrators. Cletus, however, talks Bat into flying up to Etter's Pass and explains that the pass could be considered an excellent jumping-off point for an invasion of Neuland by the Alliance forces in Bakhalla.

Bat explodes again. Such an invasion is not even a military decision—it would have to be decided by political authorities back on Earth.

Cletus calms the general. He points out that they need only pretend to threaten invasion via the pass. Neuland, in self-defense, will have to respond to it—particularly in light of their recent military failures. Then, when the Alliance

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forces demonstrate that invasion was never their intention, the only way for Dow and the Coalition to save face will be by throwing all the blame on Neuland and—as evidence of the fact the blame is real—cutting Coalition aid to Neuland Colony; a situation that can only be to the advantage of Bakhalla, and Bat.

Caught between admiration of the plan and suspicion of Cletus, Bat finally gives in and agrees that Cletus can move—no regular Alliance troops—but Eachan Khan's Dorsai mercenaries, up into the Etter's Pass area, ostensibly for more jump training. This is done.

The Neulanders, in response, gather almost their total regular ground forces on the opposite side of Etter's Pass. Cletus begins to pull out his Dorsais, but at the same time sends Bat word that something top secret has been discovered which they two should discuss secretly at Cletus's office. After some argument, Bat agrees over the phone to come secretly to the office. Cletus hangs up and leaves—setting the booby traps of the office to entrap and hold prisoner whoever enters it.

Meanwhile, the Neuland troops, having seen the Dorsais leave, are pouring through the pass with the clear intent of overrunning the Bakhallan town of Two Rivers, just below the pass.

As a result Cletus orders his Dorsais back into Etter's Pass. Colonel Dupleine, Bat's second-in-command, protests. But Cletus is under Bat's orders only, in this matter; and Bat—by now trapped in Cletus's office—cannot be found. He drops the Dorsais as jump troops in the rear of the Neulander forces attacking Two Rivers Town, and at the same time directs the naval officer Wefer Linet to dam the river below the town with the underwater bulldozers. The Neuland troops, caught between rising waters and the Dorsai fire from the heights of the bluffs behind them, are forced to surrender, en masse. Neuland is left, essentially without military forces, by this one victory.

Cletus however, in going in with the jump troops, has at last badly damaged his part-prosthetic knee. While he is still unconscious in a room of the Dorsai HQ at Two Rivers, a physician flown up from Bakhalla examines him.

"How is it, Doctor?" asked Colonel Eachan Knan, sharply. "It's going to be all right, isn't it?"

The physician shakes his head and looks at Eachan.

"No, it isn't," the physician says. "He's going to lose the knee."

Cletus, however, refused to consider a completely artificial limb. He calls in Mondar and suggests the two of them work together to stimulate his body to regrow a completely new knee joint.

The attempt is made and is successful. Cletus anticipates Bat Traynor's demands on him by resigning

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from the Alliance forces and emigrating to the Dorsai to become a Dorsai citizen, himself. However as he, with Arvid Johnson, who has also resigned and is emigrating, leave the Bakhalla spaceport, they are confronted by a bitter Lieutenant Athyer. Athyer is furious at being buried alive, career-wise, as a library officer on Cletus's recommendation to Bat, and he is also drunk. He accuses Cletus of so recommending out of personal spite—and in effect promises to find a way to revenge himself on Cletus. Cletus, who is on crutches, has to go around the man to get by.

On the Dorsai, Cletus retrains his regrown knee joint, and begins to recondition his whole body. By using the methods of physical self-control he has developed for himself, he trains himself to perform well beyond his natural limits of endurance and strength.

Then, using himself as an example, he convinces a number of the Dorsai senior officers to join with him in forming an entirely new mercenary military unit with a much more efficient individual soldier and a flexible table of organization based on Cletus's own tactical theories. The new unit is to be created with the help of a monetary loan from the Bakhallan Exotics—a loan to be guaranteed by mercenaries awaiting their new training as part of the new outfit, who will replace the Dorsais currently garrisoning Bakhalla, now that the Exotics have ordered out the Alliance forces under Bat.

The theory behind the new Dorsai unit is that it will be able to handle larger military jobs with less men—resulting in a raise in pay per individual mercenary.

News reaches Cletus that Dow deCastries is attempting to raise not only Coalition, but Alliance opinion, back on Earth against the mercenary soldiers. He goes in search of Melissa—he has been living with Eachan Khan and Melissa since emigrating to the Dorsai—and asks Melissa to marry him. She consents.

With the new mercenary unit now close to being battle-ready, Cletus goes to the scientific colony world of Newton to find work for it. On the way he stops off on Kultis to see Mondar; to whom Cletus suggests that Bakhalla finance the building of a Core Tap Power Unit at the Maran North Pole—which would allow the Exotic colonies on Mara to have an abundance of power for commercial use, and even a surplus to sell to other Maran Colonies, so usurping the Coalition position of influence there.

Mondar finds the suggestion agreeable, but points out that Bakhalla could not possibly afford such a project. Cletus suggests that she look for assistance, instead, toward the scientific colonies of Newton; and offers to speak to them, however, on behalf of the Bakhallan Exotics.

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He does, in fact, just that; and returns shortly from Newton, not only with a job for the new Dorsai unit in recapturing Newtonian stibnite mines but with word that the Newtonians will make it possible for the Bakhallan Exotics to build the power tap; a proposition he has sold to the Newtonians with resounding success.

Leaving a grateful Mondar, Cletus returns to the Dorsai just in time for the day of his wedding. He finds the guests are gathered in Eachan Khan's house, but Melissa has changed her mind. Eachan Khan informs him that she has decided against marrying him. Cletus goes in search of her, stopping only to strap on his power pistol. When he finds her, off by herself in the garden, he informs her that the marriage will go through whether she likes it or not. She sees the gun he is wearing, and for the first time realizes that among the invited guests Cletus's officers and partisans outnumber by more than two to one those who would back her father in case of a dispute.

Cletus takes her arm and leads her into the house, where they encounter Eachan. Cletus tells the older man that Melissa has changed her mind, that the marriage will go through after all. But Eachan notes the gun at Cletus's hip and insists on hearing from Melissa herself that the marriage is to go through.

The two men are seconds away from a conflict that must end in the death of at least one of them, if not of both and most of the rest of the guests present for the wedding. Melissa, to avert this, insists to her father that the wedding is her own idea—and so she and Cletus are married.

Later, after the guests have gone and they are alone together in the new home Cletus has had built on Dorsai, Melissa demands to know why Cletus did it—why he forced the marriage through?

He answers that otherwise Dow would have come for her—and taken her away.

"Eachan would have followed you to Earth," says Cletus. "That's what Dow would count on. That's what I couldn't allow. I need Eachan Khan for what I've got to do."

"Then," she says, at last, "you never did love me?"

"Did I ever say I did?" he answers; and, turning, goes out of the bedroom before she can prolong the conversation.

Part 4

XX

The next morning Cletus got busy readying the expeditionary contingent of new-trained and not yet new-trained Dorsais he would be taking with him to Newton. Several days later, as he sat in his private office at the Foralie training

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grounds, Arvid stepped in to say that there was a new emigrant to the Dorsai, an officer-recruit who wanted to speak to him.

"You remember him, I think, sir," said Arvid, looking at Cletus a little grimly. "Lieutenant William Athyer—formerly of the Alliance Expeditionary Force on Bakhalla."

"Athyer?" said Cletus. He pushed aside the papers on the float desk in front of him. "Send him in, Arv."

Arvid stepped back out of the office. A few seconds later, that same Bill Athyer, whom Cletus had last seen drunkenly barring his way in the in-town spaceship terminal of Bakhalla, hesitantly appeared in the doorway. Athyer was dressed in the brown uniform of a Dorsai recruit with probationary officer's insignia where his first lieutenant's silver bars had been worn.

"Come in," said Cletus, "and shut the door behind you."

Athyer obeyed and advanced into the room.

"It's good of you to see me, sir," he said, slowly. "I don't suppose you ever expected me to show up like this . . ."

"Not at all," said Cletus. "I've been expecting you. Sit down."

He indicated the chair in front of his desk. Athyer took it almost gingerly.

"I don't know how to apologize—" he began.

"Then don't," said Cletus. "I take it life has changed for you?"

"Changed!" Athyer's face lit up. "Sir, you remember at the Bakhalla Terminal . . . ? I went back from there with my mind made up. I was going to go through everything you'd ever written—everything—with a fine-toothed comb, until I found something wrong, something false, I could use against you. You said not to apologize, but—"

"And I meant it," said Cletus. "Go on with whatever else you were going to tell me."

"Well, I . . . suddenly began to understand it, that's all," said Athyer. "Suddenly it began to make sense to me. and I couldn't believe it! I left your books and started digging into everything else I could find in that Exotic library in Bakhalla on military art. And it was just what I'd always read, no more, no less. It was *your* writing that was different. Sir, you don't know the difference!"

Cletus smiled.

"Of course, of course you do!" Athyer interrupted himself. "I don't mean that. What I mean is, for example, I always had trouble with math. I wasn't an Alliance Academy man, you know. I came in on one of the reserve officer programs and I could sort of slide through on math. And that's what I did until one day when I ran into solid geometry. All at once the figures and the shapes came together—it was beautiful. Well, that was how it was with your writing, sir. All of a sudden, the art and the

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mechanics of military strategy came together. All the dreams I'd had as a kid of doing great things—and all at once I was reading how they could be done. Not just military things—all sorts and kinds of things."

"You saw that in what I'd written, did you?" asked Cletus.

"Saw it!" Athyer reached up a hand and closed its fingers slowly on empty air. "I saw it as if it were *there,* three-dimensional, laid out in front of me. Sir . . . nobody knows what you've done in those volumes you've written. Nobody appreciates . . . and it's not only what your work offers now, it's what it offers in the future!"

"Good," said Cletus. "Glad to hear you think so. And now what can I do for you?"

"I think you know, sir, don't you?" Athyer said. "It's because of what you'd written that I came here, to the Dorsai. But I don't want to be just one of your command. I want to be close, where I can go on learning, from you. Oh, I know you won't have any room for me on your personal staff right away, but if you could keep me in mind—"

"I think room can be made for you," said Cletus. "As I say, I've been more or less expecting you. Go see Commandant Arvid Johnson and tell him I said to take you on as his assistant. We'll waive the usual training requirement and you can go along with the group we're taking to employment on Newton."

"Sir . . ." words failed Athyer.

"That's all, then," said Cletus, raking back in front of him the papers he had pushed aside earlier. "You'll find Arvid in the office, outside."

He returned to his work.

Two weeks later the Dorsai contingent for Newton landed on that Colony World, ready for employment—and newly commissioned Force Leader Bill Athyer was among them.

". . . I hope," said Artur Walco several days after that, as he stood with Cletus watching the contingent at evening parade, "your confidence in yourself hasn't been exaggerated, Marshal."

There was almost the hint of a sneer on his voice, as the Chairman of the Board of the Advanced Associated Communities on Newton used the title Cletus had adopted for himself as part of his general overhaul of unit and officer names among the new-trained Dorsai. They were standing together at the edge of the parade ground with the red sun in the gray sky of Newton sinking to the horizon behind the flagstaff with its already half-lowered flag, as Major Swahili brought the regiment to the point of dismissal. Cletus turned to look at the thin, balding Newtonian.

"Exaggeration of confidence," he said, "is a fault in people who don't know their business."

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"And you do?" snapped Walco.

"Yes," answered Cletus.

Walco laughed sourly, hunching his thin shoulders in their black jacket against the northern wind coming off the edge of the forest that here marched right to the limits of the Newtonian town of Debroy—that same forest which rolled northward unbroken for more than two hundred miles to the stibnite mines and the Brozan town of Watershed.

"Two thousand men may be enough to take those mines," he said, "but your contract with us calls for you to hold the mines for three days—or until we get Newtonian forces in to relieve you. And within twenty-four hours after you move into Watershed, the Brozans can have ten thousand regular troops on top of you. How you're going to handle odds of five to one, I don't know."

"Of course not," said Cletus. The flag was all the way down now and Major Swahili had turned the parade over to his adjutant to dismiss the men. "It's not your business to know. It's only your business to write a contract with me providing that we get our pay only after control of the mines has been delivered to your troops. And that you've done. Our failure won't cause your Advanced Associated Communities any financial loss."

"Perhaps not," said Walco, viciously, "but my reputation's at stake."

"So's mine," replied Cletus cheerfully.

Walco snorted and went off.

Cletus watched him go for a second, then turned and made his own way to the headquarters building of the temporary camp that had been set up for the Dorsais here on the edge of Debroy under the shadow of the forest. There, in the map room, he found Swahili and Arvid waiting for him.

"Look at this," he said, beckoning them both over to the main map table, which showed in relief the broad band of forest with Debroy at one end of the table and the stibnite mines around Watershed at the other. The two men joined him at the Debroy end of the table. "Walco and his people expect us to fiddle around for a week or two, getting set here before we do anything. Whatever Brozan spies are keeping tab on the situation will accordingly pick up the same idea. But we aren't going to waste time. Major—"

He looked at Swahili, whose scarred, black face was bent with interest above the table top. Swahili lifted his eyes to meet Cletus's.

"We'll start climatization training of the troops inside the edge of the forest here, tomorrow at first light," Cletus said. "The training will take place no more than five miles deep in the forest, well below the Newtonian-Brozan frontier." He pointed to a red line running

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through the forested area some twenty miles above Debroy. "The men will train by Forces and Groups; and they aren't going to do well. They aren't going to do well at all. It'll be necessary to keep them out overnight and keep them at it until your officers are satisfied. Then they can be released, group by group as their officers think they're ready, and allowed to return to the camp, here. I don't want the last group out of the forest until two and a half days from tomorrow morning. You leave the necessary orders with your officers to see to that."

"I won't be there?" asked Swahili.

"You'll be with me," answered Cletus. He glanced at the tall young commandant to his right. "So will Arvid and two hundred of our best men. We'll have split off from the rest the minute we're in the woods, dispersed into two and three-man teams and headed north to rendezvous five miles south of Watershed, exactly four days from now."

"Four days?" echoed Swahili. "That's better than fifty miles a day on foot through unfamiliar territory."

"Exactly!" said Cletus. "That's why no one—Newtonians or Brozans—will suspect we'd try to do anything like that. But you and I know, don't we, Major, that our best men can make it?"

His eyes met the eyes in Swahili's dark and unchanging face.

"Yes," said Swahili.

"Good," said Cletus, stepping back from the table. "We'll eat now, and work out the details this evening. I want you, Major, to travel along with Arv. here. I'll take Force Leader Athyer along with me, and travel with him."

"Athyer," queried Swahili.

"That's right," replied Cletus, dryly, "wasn't it you who told me he was coming along, now?"

"Yes," answered Swahili. It was true, oddly enough, Swahili seemed to have taken an interest in the newly-recruited, untrained Athyer. It was an interest apparently more of curiosity than sentiment—for if ever two men were at opposite poles, it was the major and the force leader. Swahili was far and away the superior of all the new-trained Dorsais, men and officers alike, having surpassed everyone in training, with the exception of Cletus, in the matter of autocontrol. Clearly, however, Swahili was not one to let interest affect judgment. He looked with a touch of amusement at Cletus, now.

"And, of course, since he'll be with you, sir . . ." he said.

"All the way," said Cletus, levelly. "I take it you've no objection to having Arv with you?"

"No, sir." Swahili's eyes glanced at the tall young commandant with something very close to respect.

"Good," said Cletus. "You can take off, then. I'll meet you here an

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hour after we finish our dinner."

"Yes."

Swahili went out.

Cletus himself turned toward the door; and found Arvid still there, standing almost in his way. Cletus stopped.

"Something the matter, Arv?" Cletus asked.

"Sir . . ." began Arvid, and he did not seem to be able to continue.

Cletus made no attempt to assist the conversation. He merely stood, waiting.

"Sir," said Arvid again, "I'm still your aide, aren't I?"

"You are," said Cletus.

"Then," Arvid's face was stiff and a little pale, "can I ask why Athyer should be with you in an action like this, instead of me?"

Cletus looked at him coldly. Arvid held himself stiffly, and his right shoulder was still a little hunched under his uniform coat, drawn forward by the tightening of the scar tissue of the burn he had taken back at the BOQ in Bakhalla, protecting Cletus from the Neuland gunmen.

"No, Commandant," said Cletus, slowly, "you can't ask me why I decide what I do—now or ever."

They stood facing each other.

"Is that clear?" Cletus said, after a moment.

Arvid stood even more stiffly. His eyes seemed to have lost Cletus; his gaze traveled past Cletus to some spot on the further wall.

"Yes, sir," he finally murmured.

"Then you'd probably better be getting to evening meal, hadn't you?" said Cletus.

"Yes, sir."

Arvid turned and went out. After a second, Cletus sighed and also left for his own quarters and a solitary meal served there by his orderly.

At nine the following morning, he was standing with Force Leader Bill Athyer, five miles inside the forest fringe, when Swahili came up to him and handed him the matchbox-sized metal case of a peep-map. Cletus tucked it into a jacket pocket of his gray-green field uniform.

"It's oriented?" he asked Swahili. The major nodded.

"With the camp as base point," Swahili answered. "The rest of the men tagged for the expedition have already left—in two and three-man teams, just as you said. The commandant and I are ready to go."

"Good," said Cletus. "We'll get started too—Bill and I. See you at the rendezvous point, five miles below Watershed in approximately ninety-one hours."

"We'll be there, sir." With a single, slightly humorous glance at Athyer, Swahili turned and left.

Cletus turned the peep-map over in the palm of his hand, exposing the needle of the orientation compass under its transparent cover. He pressed the button in the side of the case and the needle swung

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clockwise some forty degrees until it pointed almost due north into the forest. Cletus lined himself up with a tree trunk as far off as he could see through the dimness of the forest in that direction. Then he put the peephole at one end of the instrument to his eye and gazed through it. Within, he saw the image of what appeared to be a ten-by-twelve foot relief map of the territory between his present position and Watershed. A red line marked the route which had been programmed into the map. Reaching for another button on the case he cranked the view in close to study the detail of the first half dozen miles. It was all straight forest with no bog land to be crossed or avoided.

"Come on," he said over his shoulder to Athyer. Putting the peep-map into his pocket, he started off at a jog trot.

Athyer followed him.

For the first couple of hours they trotted along, side by side without speaking, enclosed in the dimness and silence of the northern Newtonian forest. There were no flying creatures, neither birds nor insects, in this forest. Only the amphibious and fishlike life of its lakes, swamps and bogs. Under the thick cover of the needlelike leaves that grew only on the topmost branches of the native trees, the ground was bare except for the leafless tree trunks and lower branches but covered with a thick coat of blackened, dead needles fallen from the trees in past seasons. Only here and there, startling and expectedly, there would be a thick clump of large, flesh-colored leaves as much as four feet in length, sprouting directly from the needle-bed to signal the presence of a spring or other damp area of the jungle floor beneath.

After the first two hours, they fell into an alternate rhythm of five minutes at a jog trot, followed by five minutes at a rapid walk. Once each hour they stopped for five minutes to rest; dropping at full length upon the soft, thick needle carpet without bothering even to remove the light survival packs they wore strapped to their shoulders.

For the first half hour or so, the going had been effortful. But after that they warmed to the physical movement, their heartbeats slowed, their breathing calmed—and it seemed almost as if they could go on forever like this. Cletus ran, or walked, with the larger share of his mind abstract, far away in concentration on other problems. Even the matter of periodically checking their progress with the directional compass on the peep-map was an almost automatic action for him, performed by reflex.

He was roused from this at last by the fading of the already dim light of the forest about them. Newton's sun, hidden between its

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double screen of the tree tops foliage and the high, almost constant cloud layer that gave the sky its usual gray, metallic look, was beginning to set.

"Time for a meal break," said Cletus. He headed for a flat spot at the base of a large tree trunk and dropped into a sitting position, crosslegged with his back to the trunk, stripping off his shoulder pack as he did so. Athyer joined him on the ground. "How're you doing?"

"Fine, sir," grunted Athyer.

In fact, the other man was looking as good as he claimed to feel, and this Cletus was glad to see. There was only a faint sheen of perspiration on Athyer's face, and his breathing was deep and unhurried.

They broke out a thermo meal pack apiece and punctured the seal to start warming the food inside. By the time it was hot enough to eat, the darkness around them had closed in absolutely. It was as black as the inside of some sealed room, underground.

"Half an hour until the moons start to rise," Cletus said into the darkness in the direction in which he had last looked to see the seated Athyer. "Try and get some sleep, if you can."

Cletus himself lay back on the needles, and made his limbs and body go limp. In a few seconds, he felt the familiar drifting sensation. Then it seemed that there was perhaps thirty seconds of inattention, and he opened his eyes to find a pale light filtering down through the leaf cover of the forest.

It was still only a fraction as bright as the filtered daylight had been, but already it was bright enough so that they could see to travel. That brightness would perhaps double when at least four of Newton's five moons should be in the night sky together.

"Let's move," said Cletus. A couple of minutes later, he and Athyer, packs on back, were once more jog trotting upon their route.

The peep-map, when Cletus consulted it by its own inner illumination, now showed a black line paralleling the red line of their indicated route for a distance of a little over thirty-one miles from their starting point. In the next nine hours of nighttime traveling, interrupted only by the hourly rests and a short meal-break around midnight, they accomplished another twenty-six miles before the setting of most of the moons in the sky dimmed the light once more below the level of illumination at which it was safe to travel. They ate a final, light meal and dropped off into five hours of deep slumber on the thick needle bed of the forest floor.

When Cletus's wrist alarm woke them, the chronometer showed that over two hours of daylight had already elapsed. They arose, ate, and moved on as soon as possible.

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For the first four hours they made good progress—if anything, they were traveling even a little faster than they had the day before. But around noon they entered into an area of bog and swamp, thick with plants of the big, flesh-colored leaf, and something new called parasite vines, great ropes of vegetation hanging from the low limbs of the trees, or stretching out across the ground for miles and sometimes as thick as an oil drum in cross section.

They were slowed and forced to detour. By the time night fell, they had made only an additional twenty miles. They were barely one third of the distance to the rendezvous point below Watershed, nearly one third of their time had gone, and from now on fatigue would slow them progressively. Cletus had hoped to cover nearly half the distance by this time.

However, the peep-map informed him that another twenty miles would bring them out of this boggy area and into more open country again. They had their brief supper during the half hour of darkness and then pushed on during the night. They reached the edge of the bog area just before the moonlight failed them. They fell on the needle carpet underfoot and into slumber, like dead men.

The next day the going was easier but exhaustion was beginning to slow their pace. Cletus traveled like a man in a dream, or in a high fever, hardly conscious of the efforts and wearinesses of his body except as things perceived dimly, at a distance. But Athyer was running close to the end of his strength. His face was gray and gaunt, so that the harsh beak of his nose now seemed to dominate all the other features in it, like the battering-ram prow of some ancient wooden vessel. He managed to keep the pace as they trotted, but when they slowed to a walk, occasionally his foot would go down loosely and he stumbled. That night, Cletus let them both sleep for six hours after the evening meal.

They made less than sixteen miles in the hours of moonlight that remained to them, before stopping to sleep again for another six hours.

They woke with the illusion of being rested and restored to full strength. However, two hours of travel during the following daylight found them not much better than they had been twenty-four hours before. However, they were traveling more slowly and more steadily now, portioning out their strength as a miser portions out the money for necessary expenses. Once again, Cletus was back in his state of detachment, his bodily suffering seemed remote and unimportant. The feeling clung to his mind that he could go on like this forever, if necessary, without even stopping for food or rest.

By now, in fact, food was one of

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the least of their wants. They paused for this midday meal break and forced themselves to swallow some of the rations they carried, but without appetite or sense of taste. The ingested food lay heavily in their stomachs and when darkness came neither of them could eat. They dug down to the base of one of the flesh-colored leafed plants to uncover the spring that was bubbling there, and drank deeply before dropping off into what was now an almost automatic slumber. After a couple of hours of sleep, they rose and went on under the moonlight.

Dawn of the fourth day found them only half a dozen miles from the rendezvous point. But when they tried to get to their feet with their packs on, their knees buckled and gave under them like loose hinges. Cletus continued to struggle, however, and after several tries, found himself at last on his feet and staying there. He looked around and saw Athyer, still on the ground, unmoving.

"No use," croaked Athyer. "You go on."

"No," said Cletus.

He stood, legs stiff and braced, a little apart. He swayed slightly, looking down at Athyer.

"You've got to go on," said Athyer, after a moment. It was the way they had gotten in the habit of talking to each other during the last day or so—with long pauses between one man's words and the other's reply.

"Why did you come to the Dorsai?" asked Cletus, after one of these pauses. Athyer stared at him.

"You," said Athyer. "You did what I always wanted to do. You were what I always wanted to be. I knew I'd never make it the way you have. But I thought I could learn to come close."

"Then learn," said Cletus, swaying. "Walk."

"I can't," said Athyer.

"No such thing as can't—for you," said Cletus. "Walk."

Cletus continued to stand there. Athyer lay where he was for a few minutes. Then his legs began to twitch. He struggled up into a sitting position and tried to get his legs under him, but they would not go. He stopped, panting.

"You're what you've always wanted to be," said Cletus slowly, swaying above him. "Never mind your body. Get Athyer to his feet. The body will come along naturally."

He waited. Athyer stirred again. With a convulsive effort he got to his knees, wavered in a half-kneeling position, and then with a sudden surge lifted to his feet, stumbled forward for three steps and caught hold of a tree trunk, to keep from going down again. He looked over his shoulder at Cletus, panting but triumphant.

"When you're ready to go," said Cletus.

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Five minutes later, though Athyer still stumbled like a drunken man, they were moving forward. Four hours later they made it to the rendezvous point, to find Swahili and Arvid, together with perhaps a fifth of the rest of the men due to arrive at this point, already there. Cletus and Athyer collapsed without even bothering to take off their back packs and they were asleep before they touched the needle-carpeted ground.

XXI

Cletus woke about mid-afternoon. He felt stiff and a little lightheaded, but rested and extremely hungry. Athyer was still sleeping heavily, like a man under deep anesthesia.

Cletus ate and joined Swahili and Arvid.

"How many of the men are in?" he asked Swahili.

"There're twenty-six who haven't shown up yet," answered Swahili. "We got most of the rest in during the next hour after you got here."

Cletus nodded.

"Good," he said. "Then they should be slept up enough to operate by twilight. We'll get busy with the ones that are already rested, right now. The first thing we need is a vehicle."

So it happened that a Brozan truck driver sliding on his air jets down the single fused-earth highway leading into the small mining town of Watershed, unexpectedly found his way barred by half a dozen armed men in gray-blue uniforms, each with a small blue and white flag of the Advanced Associated Communities stapled over the left breast pocket. One of these, a tall officer wearing a circle of stars on each shoulder tab, stepped up on the footrest entrance to his cab and opened the door.

"Out," said Cletus, "we need this truck of yours."

Two hours later, just before sunset, that same truck drove into Watershed from a highway which had been strangely unproductive of traffic during the last hundred and twenty minutes. There were two men in the cab without caps on and they drove the truck directly to the headquarters of the small police detachment which had the duty of keeping law and order in the mining town.

The truck pulled into the parking compound behind the police headquarters, and a few moments later there was the sound of some disturbance within the headquarters itself. This, however, quietened, a few moments later the fire siren above the police headquarters burst to life like the whooping of some mad, gigantic creature. It continued to whoop as the townspeople poured out of their houses and other buildings to find the town surrounded and the streets patrolled by armed soldiers with blue and white flags stapled over the left

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breast pockets of their uniform jackets. By the time the sun was down Watershed knew it was a captured community.

"You must be crazy! You'll never get away with it!" stormed the manager of the stibnite mines when, with the mayor of the town and the head of the local police contingent, he was brought into Cletus's presence at police headquarters. "The Brozan army's headquartered at Broza City—and that's only two hours from here, even by road. They'll find out you're here in a few hours; and then—"

"They already know," Cletus interrupted him, dryly. "One of the first things I did was use your police communications here to announce the fact that we've taken over Watershed and the mines."

The mine manager stared at him.

"You *must* be crazy!" he said at last. "Do you think your five hundred men can stand up to a couple of divisions?"

"We may not have to," said Cletus. "In any case, it's no concern of yours. All I want you and these other two gentlemen to do, is to reassure the local people that they're in no danger as long as they keep off the streets and make no effort to leave the town."

There was a note in his voice which did not invite further argument. With a few additional halfhearted attempts at protest, the three officials of Watershed agreed to make a joint community call over the local phone system with the reassurance and warning he had asked them to deliver. Following which, he had them placed under guard in the police headquarters.

It was in fact less than two hours before the first elements of the Brozan army began to arrive. These were flying transports loaded with troops who quickly ringed the village at a distance of about two hundred yards inside the edge of the forest surrounding the town's perimeter. Through the rest of the night, other troops, heavy weapons, and armored vehicles could be heard arriving. By dawn, Swahili and Cletus concurred in an estimate that close to a division of Brozan soldiery, bristling with everything from belt-knives to energy weapons, enclosed Watershed and its two hundred occupying Dorsai troops.

Swahili was in good humor as he handed the field glasses back to Cletus, after making his own survey of the surrounding forest area. They were standing together on top of the communications tower, which was the tallest structure in the town.

"They won't want to use those heavy weapons indiscriminately, with all these local people on hand," said Swahili. "That means they're going to have to come in on foot—probably all around the per-

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imeter at once. I'd guess they'll attack inside the hour."

"I don't think so," answered Cletus. "I think they'll send someone in to talk, first."

He turned out to be correct. The surrounding Brozan troops did nothing for the first three hours of the morning. Then, as the cloud-veiled sun over Newton was heating the northern landscape up toward noon, a command car flying a white flag slowly emerged from the shadows of the forest and entered the town. It was met at the perimeter of Watershed by soldiers Cletus had instructed in preparation of this meeting, and it was escorted by them to the police headquarters. There, a small, spare general in his early sixties, flanked by a round man perhaps ten years younger and wearing colonel's insignia, dismounted and entered the headquarters building. Cletus received them in the office of the commander of the police detachment.

"I'm here to offer you surrender terms—" the general broke off, staring at Cletus's shoulder tabs. "I don't recognize your rank."

"Marshal," Cletus said. "We've shaken up our table or organization and our titles on the Dorsai, recently. Marshal Cletus Grahame."

"Oh? General James Van Dassel. And this is Colonel Morton Offer. As I was saying, we're here to offer you terms of surrender—"

"If it was a matter of sending surrender terms, you'd hardly have needed to come yourself, would you, General?" Cletus broke in. "I think you know very well that there's no question of our surrendering."

"No?" Van Dassel's eyebrows rose politely. "Maybe I should tell you we've got more than a full division, with a full complement of heavy weapons, surrounding you right now."

"I'm aware of that fact," said Cletus. "Just as you're completely aware of the fact that we have something over five thousand civilians here inside our lines."

"Yes, and we're holding you strictly accountable for them," said Van Dassel. "I have to warn you that if any harm comes to them, the liberal surrender terms we're about to offer you—"

"Don't try my patience, General," interrupted Cletus. "We hold those civilians as hostages against any inimical action by your forces. So let's not waste any more time on this nonsense about our surrendering. I've been expecting you here so that I could inform you of the immediate steps to be taken by the Advanced Associated Communities with regard to Watershed and the mines.

"As you undoubtedly know, these mines were developed on land purchased from Broza by the Advanced Associated Communities, and Broza's expropriation has since

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been ruled illegal by the international court here on Newton—although Broza has seen fit until now to refuse to obey the court's order returning the mines to the Advanced Associated Communities. Our expeditionary force has already notified the Advanced Associated Communities that the mines are once more under their proper ownership, and I've been informed that the first contingents of regular A.A.C. troops will begin to arrive here by 1800 hours, to relieve my command and begin to function as a permanent occupying force."

Cletus paused.

"I'm certainly not going to permit any such occupying forces to move in here," said Van Dassel, almost mildly.

"Then I'd suggest you check with your political authorities, before you make any move to prevent them," said Cletus. "I repeat, we hold the townspeople here hostage for the good behavior of your troops."

"Nor am I willing to be blackmailed," said Van Dassel. "I'll expect notification of your willingness to surrender before the next two hours are up."

"And I, as I say," answered Cletus, "will hold you responsible for any hostile action by your command during our relief by the regular troops from the Advanced Associated Communities."

On that mutual statement, politely, they parted. Van Dassel and his colonel returned to the Brozan troops encircling the village. Cletus called in Swahili and Arvid to have lunch with him.

". . . But what if he decides to hit us before the relieving troops get here?" asked Swahili, over the lunch table.

"He won't," said Cletus. "His situation's bad enough as it is, already. The Brozan politicians are going to be asking him how he allowed us to take over Watershed and the mines here, in the first place. He might survive that question, as far as his career is concerned—but only if there's no Brozan lives lost. He knows I understand that as well as he does; so Van Dassel won't take chances."

In fact, Van Dassel did not make any move. His division surrounding Watershed sat quietly while his deadline for surrender passed, and as the relieving forces from the Advanced Associated Communities began to be airlifted in. During the following night, quietly, he withdrew his forces. By the following sunrise, as the newly-landed A.A.C. soldiery began to clear an area of the forest outside the town and construct a semi-permanent camp for themselves, there was not a Brozan soldier to be found within two hundred miles.

"Very well done indeed!" said Walco, enthusiastically, when he arrived at Watershed with the last

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of his own troops and was ushered in to the office Cletus had taken over in the police headquarters building. "You and your Dorsais have done a marvelous job. You can move out any time now."

"As soon as we're paid," said Cletus.

Walco smiled, thinly.

"I thought you might be eager to get your pay," he said. "So I brought it along with me."

He lifted a narrow briefcase onto the desk between them, took out a release form, which he passed to Cletus, and then began to remove gold certificates which he stacked on the desk in front of Cletus. Cletus ignored the form and watched coolly as the pile of certificates grew. When Walco stopped at last, and looked up at him with another broad smile, Cletus did not smile back. He shook his head.

"That's less than half of what our agreement called for," Cletus said.

Walco preserved his smile.

"True," Walco said. "But in the original agreement we envisioned hiring you for a three-month term. As it happens, you've been lucky enough to achieve your objective in less than a week and with only a quarter of your expeditionary force. We figured full combat pay for the whole week, however, for the five hundred men you used. In addition we're paying you garrison scale, not only for the rest of your men for that week but for your whole force for the rest of this month as well—as a sort of bonus."

Cletus looked at him. Walco's smile faded.

"I'm sure you remember as well as I do," said Cletus, coldly. "The agreement was for two thousand men for three months, full combat pay for everybody during that period—and no pay at all if we weren't able to deliver the stibnite mines to you. How many men I used to make that recovery and how long I took, was my concern. I expect full combat pay for three months for my entire command, immediately."

"That's out of the question, of course," said Walco, a little shortly.

"I don't think so," said Cletus. "Maybe I should remind you what I told General Van Dassel, the Brozan commander who had us encircled here: That I was holding the civilian population of Watershed hostage for his good behavior. Perhaps I should remind you that I and the men I brought here with me are still holding these people hostage—this time for your good behavior."

Walco's face became strangely set.

"You wouldn't harm civilians!" he said, after a moment.

"General Van Dassel believes I would," replied Cletus. "Now I, personally, give you my word as a Dorsai—and that's a word that's going to become something better

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than a signed contract, in time—that no single civilian will be hurt. But have you got the courage to believe me? If I'm lying, and your take-over of the mines includes a blood bath of the resident townspeople, your chances of coming to some eventual agreement with Broza about these mines will go up in smoke. Instead of being able to negotiate on the basis of having a bird in the hand, you'll have to face a colony only interested in vengeance—vengeance for an action all civilized communities will indict you."

Walco stood, staring at him.

"I don't have any more certificates with me," he said at last.

"We'll wait," answered Cletus. "You should be able to fly back and get them and return here by noon at the latest."

Shoulders slumped, Walco went. As he mounted the steps of the aircraft that had brought him to Watershed, however, he stopped and turned for a parting shot at Cletus.

"You think you're going to cut a swath through the New Worlds," he said, viciously, "and maybe you will for a while. But one of these days, everything you've built is going to come tumbling down around your ears."

"We'll see," said Cletus.

He watched the door shut behind Walco and the aircraft lift away into the sky of Newton. Then he turned to Arvid, who was standing beside him.

"By the way, Arv," he said, "Bill Athyer wants to have the chance to study my methods of tactics and strategy at close hand. So he'll be taking over as my aide as soon as we're back on the Dorsai. We'll find a Command for you, out in the field, somewhere. It's about time you were brushing up on your combat experience, anyway."

Without waiting for Arvid's response, almost brutally, he turned his back on the younger man and walked off, turning his mind to other problems.

XXII

"Your prices," said James Arm-Of-The-Lord, Eldest of the First Militant Church, on both the neighboring worlds of Harmony and Association—those two worlds called the Friendlies—"are outrageous."

James Arm-Of-The-Lord was a small, frail, middle-aged man with sparse gray hair—looking even smaller and more frail than he might otherwise in the tight black jumper and trousers that was the common dress of those belonging to the fanatical sects which had colonized, and later divided and multiplied, on the surfaces of Harmony and Association. At first sight he seemed a harmless little man, but a glance from his dark eyes, or even a few words spoken aloud by him, were enough to destroy that illusion. Plainly he was

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one of those rare people who burn with an inner fire—but the inner fire that never failed in James Arm-Of-The-Lord was a brand of woe and a torch of terror to the Unrighteous. Nor was it lessened by the fact that the ranks of the Unrighteous, in James's estimation, included all those whose opinions in any way differed from his own. He sat now in his office at Government Center on Harmony, gazing across the desk's bare, unpolished surface at Cletus, who sat opposite.

"I know we're priced beyond your means," said Cletus. "I didn't come by to suggest that you hire some of our Dorsais. I was going to suggest that possibly we might want to hire some of your young men."

"Hire out our church members to spend their blood and lives in the sinful wars of the Churchless and the Unbelievers?" asked James. "Unthinkable!"

"None of your colonies on Harmony or Association have anything to speak of in the way of technology," said Cletus. "Your Militant Church may contain the largest population of any of the Churches on these two worlds, but you're still starving for real credit—of the kind you can use in interworld trading to set up the production machinery your people need. You could earn that credit from us, as I say, by hiring out some of your young men to us."

James's eyes glittered like the eyes of a coiled snake in reflective light.

"How much," he snapped.

"The standard wages for conventional mercenary soldiers," replied Cletus.

"Why, that's barely a third of what you asked for each of your Dorsais!" James's voice rose. "You'd sell to us at one price, and buy from us at another?"

"It's a matter of selling and buying two different products," answered Cletus, unmoved. "The Dorsais are worth what I ask for them because of their training and because by now they've established a reputation for earning their money. Your men have no such training, and no reputation. They're only worth what I'm willing to pay for them. On the other hand, not a great deal would be demanded of them. They'd be used mainly as diversionary forces like our jump-troops in our recent capture of Margaretha, on Freiland."

The taking over of Margaretha on Freiland had been the latest of a series of successful engagements fought by the new-trained Dorsai mercenaries under Cletus's command. Over a year had gone by since the capture of the stibnite mines on Newton, and in that time they had conducted campaigns leading to clear-cut and almost bloodless victories on the worlds of Newton's sister planet of Cassida, St. Marie, a smaller world under the Procyon sun with Mara and

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Kultis, and most recently on Freiland, which, with New Earth, were the inhabited planets under the star of Sirius.

Margaretha was a large, ocean-girt island some three hundred miles off the northeastern shore of the main continental mass of Freiland. It had been invaded and captured by the nearest colony adjoining it on the mainland mass. The island's government in exile had raised the funds to hire the Dorsais to recapture their homeland from the invaders.

Cletus had feinted with an apparent jump-belt troop drop of untrained Dorsais over Margaretha's main city. But meanwhile he had sent several thousand trained troops into the island by swimming them ashore individually at night at innumerable points around the coastline of the island. These infiltrators had taken charge of and coordinated the hundreds of spontaneous uprisings that had been triggered off among the island's native population by word of the jump-troop drop.

Faced with uprisings from within and evident attack from without, the mainland troops which had seized the island chose discretion as the better part of valor and abandoned the island for their home colony. They reached home only to discover how few had been the troops that had actually driven them out, and turned swiftly about to return to Margaretha.

However, when they reached the island this second time, they found watchfires burning on all the beaches, and the native population aroused, armed, and this time ready to die between the tide-marks rather than let a single mainlander invader ashore.

As with Cletus's other military successes, it had been a victory achieved through a careful blending of imagination and psychology with what was now beginning to be regarded, on the other Colony Worlds, as the almost superhuman abilities of the trained Dorsai soldiers. Clearly, for all his apparent unwillingness to listen to Cletus's offer, James was not unaware of the hard facts and advantages of the proposition. It was typical of Elders, such as James, that they were either pro or con, but never admitted to indecision.

Cletus took his leave, accordingly, having planted the seed of an idea in a Friendly mind, and being content to bide his time and let it grow.

He took spaceship to New Earth, that sister planet of Freiland, where his command of Dorsais and a new military campaign was waiting for him. Marcus Dodds, Eachan's old second-in-command, met him at the Dorsai camp just outside of Adonyer, main city of Breatha Colony, their employers on New Earth. In spite of the two new stars on each of his shoulder tabs mark-

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ing him as Field Commander with a full division of mercenaries under him, Marcus's face was solemn with concern.

"Spainville's formed an alliance with four of the five other City-States of the interior plains," he told Cletus, as soon as they were alone in Marcus's office. "They call it the Central Combine, and they've mustered a combined army of better than twenty thousand regular troops. Not only that, they're ready and waiting for us. We aren't going to be able to use surprise the way we have in other campaigns. And this short division you've given me here has less than five thousand men."

"True enough," said Cletus, thoughtfully. "What do you suggest I do about it?"

"Break the contract with Breatha," said Marcus strongly. "We can't possibly go up against this Central Combine now without more men. And how many other new-trained Dorsais are there? Certainly not more than a couple of hundred. We've got no choice but to break the contract. You can cite the fact that the situation has changed since we were hired. Breatha may squawk, but responsible people in other colonies wanting to hire us will understand. If we don't have the troops—that's all there is to it."

"No," said Cletus thoughtfully. He got up from his seat beside Marcus's desk and walked across the room to a map showing the flat plains area of the continental interior which Breatha shared with its rivals, five other colonies, each of which were essentially farming communities centered around one large city—hence their common name of City-States. "I don't want to start breaking contracts, no matter how well justified we are."

He studied the map for a minute. Breatha, with a narrow corridor running to the coast, was surrounded by the City-States of the interior on four of its five sides like an apple in the mouth of a boar. Originally it had been the manufacturing center which supplied the City-States with most of their factory-made equipment and brought farm produce from the City-States in return. But then Spainville, the largest of the five City-States, had ventured into manufacturing on its own, sparking off a like action in the other City-States—one of which, called Armoy, had chosen to construct a deep-space spaceport in competition with the one existing in Breatha colony.

Now, with economic ambition burning bright in the former agricultural colonies of the central plain, Spainville, which bordered on Breatha's corridor to the sea, had chosen to lay claim upon that corridor and threaten to take it over by armed force if Breatha did not yield it peacefully. Hence, the presence of the Dorsais on the Breatha payroll.

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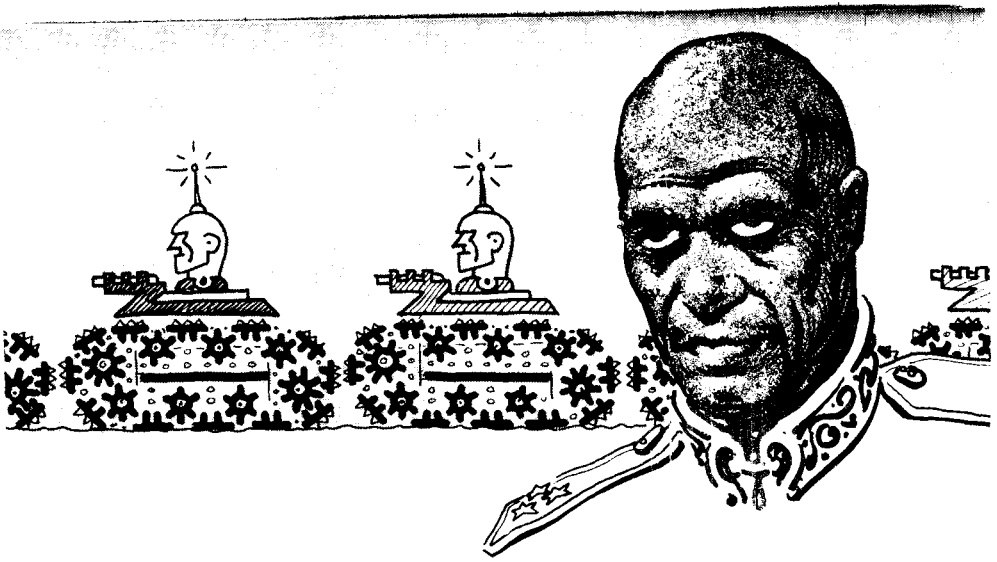

"On the other hand," said Cletus, turning back to Marcus, "if they believed we'd been reinforced, that might be almost as good as actually getting the necessary extra troops in here."

"How're you going to make them think that?" demanded Marcus.

"It may take some thought," Cletus smiled. "At any rate I'll make a quick trip back to the Dorsai now as if I were going after extra men; and see if I can't work out a plan on the way."

Having announced his intentions, Cletus wasted no time. By late that evening, he was on board a deep-space vessel which had the Dorsai as its next port of call. Three days later he was back in Foralie. Melissa met him at the doorway of Grahame-House with a warmth that was surprising. Since the marriage, slowly, she had been softening toward him; and since the birth of their son, three months ago, that process had accelerated even while it seemed that all those others who had once been close to Cletus were becoming more and more estranged to him.

Typical of these others was Eachan, her father, whose greeting of Cletus was almost as detached and wary as that which might be accorded a stranger. At the first opportunity, he got Cletus away from Melissa and the child to speak bluntly to this son-in-law of his.

"Have you seen these?" he asked, spreading an assortment of news clippings out on the desk before Cletus. They were standing in Cletus's office-study, in the west wing of Grahame-House. "They're all from Earth news services—Alliance and Coalition alike."

Cletus glanced over the clippings. Unanimously, they were concerned with the Dorsais and himself. Not only that, but their vituperative tone was so much in

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common amongst them, that they could have been the product of a single voice.

"You see?" Eachan challenged, as Cletus finally looked up from the clippings. "It was the Coalition news service that started calling you a pirate after the Bakhalla business. But now the Alliance has taken it up, too. These City-States you're hired to go against on New Earth are backed by Alliance as well as Coalition aid and investment. If you don't look out you'll have the Alliance as well as the Coalition laying for you. Look"—his brown right forefinger stabbed at one of the clippings—"read what Dow deCastries said in a speech in Delhi: *'If nothing else, the peoples of the Coalition and the Alliance both can join in condemning the brutal and bloody activities of the ex-Alliance renegade, Grahame . . .'* "

Cletus laughed.

"You think this is funny?" said Eachan grimly.

"Only in its predictability," answered Cletus, "and in the obviousness of Dow's intentions."

"You mean you've been expecting this—expecting deCastries to make speeches like that?" demanded Eachan.

"Yes," answered Cletus. He dismissed the subject. "Never mind that. I'm back here to go through the motions of transporting an imaginary extra division of troops to Breatha Colony. I'll need at least two deep-space transports. Maybe we can arrange to lease some empty cargo spaceships for a diversionary trip—"

"You'd better listen to something else first," Eachan interrupted him. "Did you know you're losing Swahili?"

Cletus raised his eyebrows.

"No," he murmured. "But it's not surprising."

Eachan opened a drawer of Cletus's library desk, and took out a resignation form, which he dropped on the table on top of the news clippings, in front of Cletus. Cletus looked down at it. Sure enough, it was made out and signed by Swahili, now a one-star General Field Commander. Promotions had come thick and fast among those men who had been with Cletus from the beginning. Only Arvid, now in the field, was still a commandant; and Eachan who had refused the one promotion offered him. By contrast, the once-ineffective Bill Athyer was now a rank above Arvid as Commandant Senior Grade, less than two ranks away from Field Commander with command of a regiment.

"I suppose I'd better talk to him," said Cletus.

"Not that it'll do you any good," replied Eachan.

Cletus accordingly invited Swahili up from his post at the main new-training center, now on the far

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side of Foralie. The next day they met briefly in that same office-study where Eachan had confronted Cletus with the news clippings shortly after his arrival home.

"Of course, I'm sorry to lose you," said Cletus, as the two faced each other. Swahili, the single star gleaming gold on each of his shoulder tabs, bulked larger than ever in his blue dress uniform. "But I imagine you've completely made up your mind."

"Yes," said Swahili. "You understand, don't you?"

"I think so," said Cletus.

"I think you do," echoed Swahili softly, "even if it is just the opposite of the way you like to do things. You've taken all the life out of war—you know that, don't you?"

"It's the way I like it," said Cletus.

Swahili's eyes flashed a little in the soft light of the peaceful library-office.

"It's not the way I like it," Swahili said. "What I like is what nearly everyone else hates—hates or is scared sick of. And it's that you've taken out of the business for everybody who serves under you."

"You mean the combat, itself," said Cletus.

"That's right," said Swahili, softly. "I don't like being hurt and all the weeks in the hospital, any more than the next man. I don't want to die. But I put up with all the rest of it—all the training, all the hurry-up-and-waiting, all the marking time between engagements —I put up with all that, just for the few hours when everything turns real."

"You're a killer. Or don't you admit that to yourself?" asked Cletus.

"No," said Swahili. "I'm a special fighter that's all. I like to fight. Just the killing itself wouldn't do anything for me. I told you I didn't want to get hurt, or killed, any more than the next man. I feel just as hollow inside when the energy weapons start burning the air over my head. At the same time, I wouldn't miss it for anything. It's a dirty, damn universe; and every once in a while I get a chance to hit back at it. That's all. If I knew in the morning when I started out that I was going to be killed that day, I'd still go—because I couldn't die happier than to go down hitting back."

He stopped talking, abruptly. For a moment he simply looked at Cletus in the silence of the room.

"And it's that you've taken out of mercenary work," he said. "So I'm going some place else where they still have it."

Cletus held out his hand.

"Good luck," he said.

They shook hands.

"Luck to you," said Swahili. "You'll need it. In the end the man with gloves on always loses to the bare-knuckle fighter."

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"You'll have your chance to test that belief, at least," said Cletus.

XXIII

A week later Cletus returned to New Earth with two leased cargo vessels, the crew and officers of which had agreed to being held in a locked room during the embarking and disembarking of the troops they were supposed to carry. They could only testify afterwards to hearing the sounds of boots entering the ship for two and a half hours, on the Dorsai, and to some four hours of similar sounds as they hung in orbit above New Earth, while landing craft shuttled from their ships to some unannounced spot on the planet below. Agents for the Central Combine of City-States, however, observed these landing craft making their sitdowns in a wooded area just inside Breatha Colony's border with Spainville. On attempting to investigate further, the agents found themselves stopped and warned back by a cordon of armed Dorsais. Their estimates of the troops landed, taken from the number of trips from the spaceships in orbit, was of at least five thousand men.

General Lu May, Commander of the City-States combined forces, grunted when this information was brought to him.

"That's the sort of thing this Grahame likes to pull," said Lu May. He was in his mid-seventies, and had been retired from active soldiering until the new ambitions and warlike fervor of the City-States had summoned him back to take overall command of their new army. "He'd like to shake us up with the idea that we've got to watch two separate, invading commands. But I'll lay you odds he pulls them together at the first opportunity, as soon as he thinks he's got us out in the open where he can pull all sorts of fancy maneuvers. But we aren't going to fall for it. We'll stay dug in here in Spainville, and make him come to us."

He chuckled. He was fat as well as old; and the thought of being able to frustrate this unorthodox young upstart while remaining comfortably seated in his own home in Stanleyville tickled him. He ordered heavy energy weapons dug in all around the perimeter of the city and all approaches heavily mined. It would take more than the light-weaponed and light-armored Dorsai mercenaries to break through defenses such as these, even if they were equal in number to the men he had under arms inside the city to defend it.

Meanwhile, Cletus's forces were already in motion. A motley horde of civilian trucks and other heavy-duty air-cushioned sliders had earlier converged on the area where the shuttle boats had landed from the spaceships. These now moved out like a transport and supply

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convoy with an armed Dorsai driving each of them. This force crossed the border into Armoy, and swung inland toward Armoy City with its new spaceport, thereby raising flutters of alarm within the breasts of that community's citizens.

"Sit tight!" grunted Lu May to the frantic messages that reached him from Armoy City for an expeditionary force to defend them against the oncoming Dorsais. He did not send the force, but instead followed his own advice, sitting tight and watching Cletus's other command, which was also in movement now, across the Spainville border, heading apparently through Spainville toward one of the other adjoining City-States. Still Lu May made no move; and, sure enough, once it had passed the city of Spainville itself, Cletus's first command of Dorsais swung about and came up on the city's rear. At the same time, the command that had been threatening Armoy City, swung way from there and cut in to come up before the city of Spainville, so that within a few days that city was ringed by the Dorsai troops.

Lu May chortled and slapped his fat knees. Curiously enough, in Cletus's headquarters outside the city, there was hardly less satisfaction to be found in the person of a Chancellor Ad Reyes, representative of the government of Breatha Colony, who was accompanying Cletus ostensibly as an "observer".

"Excellent, Marshal. Excellent!" Reyes, who was a thin, eager scholarly-looking man with a high forehead, dressed in the long, black, official gown of his chancellorhood, rubbed his thin hands with pleasure. "You've managed to trap their army here. And there's no other force that can come to their rescue. Excellently done!"

"You should thank General Lu May for that, instead of me," Cletus answered, dryly. "He has a good deal less to fear from us, sitting back behind his mine fields and his perimeter defenses, than he does in the open field, where the Dorsais are a great deal more mobile than his troops. He has more men and he's in an entrenched position."

"But you don't have to try to take the place by assault!" protested Reyes. "You can live off the country or supply yourself from Breatha as you want. Lu May's cut off from outside supplies. It's just a matter of starving him out!"

"That may not be easy," said Cletus, "unless he's been strangely forgetful, while preparing for everything else, to stock enough provisions for the city and his troops so that they can hold out longer than we can afford to sit here besieging them."

Reyes frowned. Plainly, it seemed to him that this Dorsai marshal was taking an entirely too gloomy a view of the situation.

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"Do you object to besieging the city?" Reyes demanded. "If so, I should probably mention that the Breatha government considered this the optimum—indeed the only—course you could pursue, if you were lucky enough to trap Lu May in a fixed position."

"I don't object—for now," Cletus answered, quietly. "But that's because there's military reasons for it, far removed from the opinions of your government. I might remind you, Chancellor, that one of my stipulations in accepting employment with Breatha Colony, as it is with every government with whom I sign a contract, is that I, alone, be in charge of the conduct of the campaign."

He turned and sat down behind the desk in the office of the field structure in which they had been talking. "And now, if you'll excuse me, I've got work to do."

Reyes hesitated, then turned on his heel and walked out.

Cletus continued the siege for three weeks, throwing up breastworks and digging his own trenches behind them to encircle the city, as if he had every intention of staying indefinitely. Meanwhile, outside of an occasional exchange of small arms fire, there was little open conflict between the city defenders and its Dorsai attackers.

Meanwhile, overhead a similar unspoken truce existed. Dorsai aircraft patrolled the atmosphere above and about the city to prevent City-State vessels from entering or leaving it. But beyond this, there was no aerial conflict. As in most inter-colony armed conflicts on the New Worlds, air warfare was being avoided by the sort of tacit agreement which had interdicted the use of poison gas during World War II in the Twentieth Century on Earth. The object of armed struggle between opposed technology-poor communities such as the young colonies, was not so much to destroy the enemy's productive capacity, as to take it away from him. One did not obliterate by bombing that which one had started a war to obtain. And if the factories and other hardware of civilization were valuable, the men who had the skills to operate them were almost as valuable.

Therefore, bombing and even the indiscriminate use of heavy weapons in the vicinity of built-up areas was avoided; and—atmosphere craft being almost as expensive as spacecraft—any other use of the skies other than for reconnaissance or the transporting of troops was likewise avoided.

At the end of three weeks, however, Cletus apparently lost patience with this stalemate and issued orders. Orders which brought Chancellor Ad Reyes literally running to Cletus's headquarters office, the black gown tucked up to allow free movement to the chancellor's legs.

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"You're pulling out half your forces and sending them to take Armoy City and its spaceport!" Reyes accused him, bursting into Cletus's office.

Cletus looked up from the desk at which he was working.

"You've heard of that, have you?" Cletus asked.

"Heard of it!" Reyes strode up to the edge of the desk and leaned over it almost as if he would have liked to have thrust his face, nose to nose, with Cletus's. "I've *seen* them! All those civilian trucks you requisitioned to transport your secondary command are headed off toward Armoy! Don't tell me that isn't where they're headed!"

"That's where they're headed," said Cletus agreeably. "The rest of us will be following them in twenty-four hours. There's plainly no point in continuing this siege any longer. I'm going to raise it, move on Armoy City and take that spaceport of theirs."

"Raise the siege?" Emotion rushed Reyes in where angels should have feared to tread. "What kind of trick is this? If you'd been paid by the City-States to betray us, you couldn't have picked a better—"

He broke off abruptly, shrinking a little at the sudden sound of his own words in his ears. Cletus was on his feet behind the desk.

"I hope I don't hear you correctly, Chancellor." Cletus's voice and eyes had changed. "Are you accusing Dorsais of dishonoring a contract with your government?"

"No . . . that is, I didn't mean—" Reyes stammered.

"I'd advise you to be careful of what you do mean," said Cletus. "The Dorsais don't break contracts, and we don't tolerate talk that we do. And now, for the last time, let me remind you that I—I, alone—am in command of this campaign. Perhaps you should get back to your own quarters, now."

"Yes, I—" Reyes fled.

Just before dawn the following morning, the rest of the Dorsais besieging Spainville mounted their military vehicles and pulled out with all armor and weapons. Only their aircraft remained above Spainville to discourage pursuit by air reconnaissance from that community. Dawn rose on the empty trenches and breastworks that the mercenaries had thrown up, but it was nearly noon before their silence and abandoned appearance could tempt patrols out from Spainville to investigate. When, however, the former Dorsai positions had been investigated and found to be abandoned, the patrols took note of the direction of the signs of departure visible in the pasture earth and summer grass south of the city, and passed the word hastily to General Lu May. Lu May, roused with this news from his slumbers after a late evening the night before, swore in a

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way that had gone out of fashion forty years ago.

"We've got him!" The old man exploded, rolling out of the bed in which he had received the news, and beginning hastily to struggle into his clothes. "He couldn't stand the waiting—now he's cut his own throat!"

"Sir?" protested the colonel who had brought him the news, "cut his own throat? I don't understand—"

"That's because you kids know nothing about war the way it's really fought!" trumpeted Lu May, struggling into his trousers. "Grahame's headed for Armoy City, idiot!"

"Yes, sir," said the colonel. "But I still don't see—"

"He's faced the fact that there was no hope of his taking the city here!" snapped Lu May. "So he's pulled out and decided to take Armoy City, instead. That way he can claim that he did the best he could, and at least got Breatha Colony the spaceport that was giving them competition! With the spaceport, he'll tell them, they can make a deal to protect their corridor to the sea! Don't you see? Grahame's finally faced the fact it was a bad contract he signed. He wants to get out of it on any terms—but he can't get out unless he has at least something to offer Breatha. Armoy City and that spaceport will be it!"

"Yes, sir," said the colonel, earnestly. "I see all that. But what I don't understand is why you say he cut his own throat. After all, if he's able to give Breatha Colony the spaceport and Armoy City to bargain with—"

"Idiot! Double idiot!'" roared Lu May. "He has to take Armoy City first, doesn't he, fool?"

"Yes, sir—"

"Then he's going to have to occupy Armoy City with his forces, isn't he?" Dressed at last, Lu May waddled hastily toward the door. Over his shoulder, he continued. "If we move fast after him, we'll catch him inside Armoy City, and we can surround him, there! He's got no supplies to last in a city like that very long—and if we need to, we even have the men and weapons to take the city by storm! Either way we can wrap his Dorsais up and have him as a prisoner to do what we want with!"

Lu May wasted no time in getting his army in pursuit of Cletus and the Dorsais. But for all his hurry, he did not fail to move out in good marching order, or without the heavy energy weapons he had dug in around the perimeter of the city, and which he now took with him, even though having them with him would necessarily slow his movement. Ponderous, but deadly, he slid along over the plain track Cletus's two departing commands had left behind—through standing grass and grain.

The direction of that track aimed directly at Armoy City, per-

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haps three days travel away for Cletus's lightly-equipped Dorsais. Lu May would be lucky to do it in four with his command; but the extra day should bring the Spainville general on the scene at Armoy City, as he calculated, just in good time to take advantage of that moment in which Cletus's troops were letting down, after having made their conquest of Armoy City and the spaceport an accomplished fact.

All the same, it was wise—thought Lu May—to give himself a little time margin if at all possible. If he should find himself ahead of schedule, he could always dawdle a bit in coming up to the city at the far end of his pursuit. Therefore, he issued orders after the evening meal for his command to continue after dark, under the moonless but star-bright, New Earth sky. He pushed them on through the darkness until men began falling asleep at the controls of their vehicles, or on their feet. Finally, reluctantly, he called a halt for the night about three hours after midnight.

His army had just managed to get deeply into exhausted slumber, however, when a series of sharp, blasting explosions jerked them back to wakefulness, and they sat up to see the heavy energy weapons they had been hauling burning with sparkling red-white flames, as their energy storage units melted under their own fierce heat like butter in a furnace. In the same moment, dark-clad Dorsais were suddenly among Lu May's troops stripping them of their body-weapons and herding them into groups under the watchful eyes and guns of other mercenaries standing guard.

General Lu May himself started out of deep slumber, and sat up in his field bed to find Cletus standing over him, an uncapped holster showing the sidearm at Cletus's side. Lu May stared in befuddlement at the apparition.

"But you're . . . up ahead of me—" he stammered.

"I've got a detachment of empty civilian trucks up ahead of you," answered Cletus. "Trucks that never had any men in them except the drivers. What men I had are here with me now—and your command is taken prisoner, General. You'll make things simplest by giving me your surrender, right now."

Lu May fumbled out of bed. Suddenly he was very old, and chilly, and helpless, standing there in his pajamas. Almost humbly, he went through the motions of surrender.

Cletus went back to the field unit that had already been set up as his temporary headquarters. Waiting inside for him was Chancellor Ad Reyes.

"You can inform your government that the effective military forces of the combined City-States are now our prisoner, Chancellor—" he began; and broke off as Arvid entered, bearing a yellow message slip.

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"Signal from Colonel Khan on the Dorsai," said Arvid, "forwarded on by our base camp at Adonyer, back in Breatha Colony."

Cletus took the message sheet and unfolded it. He read:

ATTACK MADE THROUGH ETTER'S PASS FROM NEULAND INTO BAKHALLA TERRITORY, BEATEN OFF. ALLIANCE AND COALITION FORCES COMBINED IN A JOINT "PEACE FORCE" FOR THE NEW WORLDS, DOW DECASTRIES HAS SUPREME COMMAND OF THIS FORCE.

Cletus folded the message back up and put it in a pocket of his battle tunic. He turned to Reyes.

"You've got twenty-four hours," he said, "to get Breatha troops here to take charge of these prisoners we've just captured. I and my troops must return immediately to the Dorsai."

Reyes stared at him in combined awe and amazement.

"But we'd planned a triumphal parade in case of victory—" he began, uncertainly.

"Twenty-four hours," said Cletus brusquely. He turned on his heel and left the chancellor standing there.

XXIV

Landing back on the Dorsai, Cletus phoned ahead to order Major Arvid Johnson, now acting Field Commander, to meet him at Grahame-House. Then with Bill Athyer like a smaller, beak-nosed shadow at his side, he took a hired atmosphere craft to Foralie and Grahame-House, still wearing his battle uniform.

Melissa, with Arvid and Eachan, met him just inside the front door of Grahame-House. Athyer, diffident still in spite of his present rank, stood back at the far end of the entrance hall as Cletus greeted Melissa and Eachan briefly, before striding on toward the door to his office-study and beckoning Eachan and Arvid to follow him.

"You, too, Bill," he said to Athyer.

He closed the door of the office behind them.

"What's the latest word?" Cletus demanded of his father-in-law, as he walked around to stand behind the pile of message blanks on his desk, and stare down at them.

"It seems deCastries was appointed this position as Commander-in-Chief of the joint Alliance-Coalition troops on the New Worlds, several months ago," answered Eachan. "The Coalition and the Alliance just kept it secret while the two High Commands built up a news campaign to get the common citizens of Earth on both sides ready for the idea. Also, Artur Walco's here to see you. Seems like deCastries is already making

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trouble for him at those stibnite mines on Newton."

"Yes, there'll be brush wars breaking out all over the New Worlds now. I'll see Walco tomorrow morning," said Cletus. He turned to Arvid.

"Well, Arv," he said, "if the Dorsai had medals to give, I'd be handing you a fistful of them right now. I hope someday you can forgive me for this. I had to have you thinking I'd shoved you aside into the field for good."

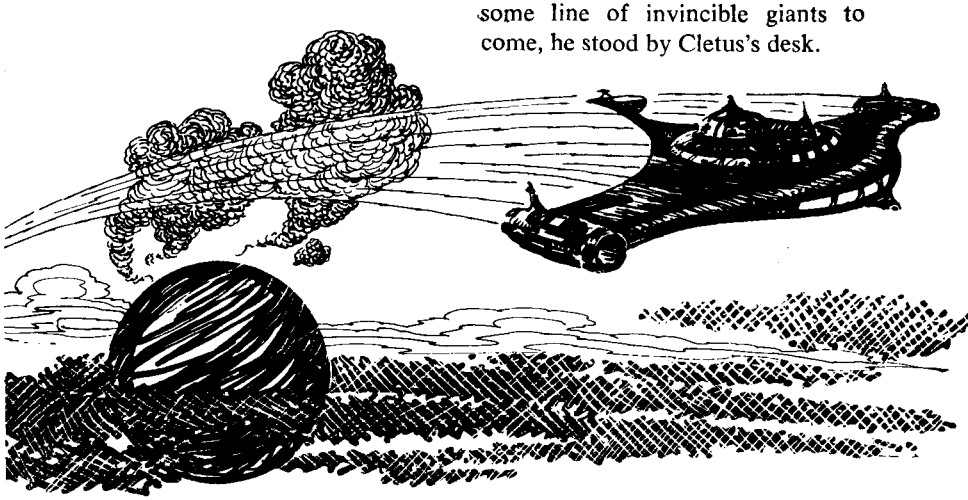
"You didn't, sir?" asked Arvid.

"No," said Cletus. "I wanted a development in you. And I've got it."

In fact, it was a different man who stood before them to answer to the name of Arvid Johnson. Not the least of the change was that he looked at least five years older. His white-blond hair had darkened as if with age, and his skin was sun-tanned darker yet. He looked to have lost weight, and yet he appeared larger than ever, a man of gaunt bone and whipcord muscle, towering over all of them.

At the same time, something was gone from him for good. A youthfulness, a friendly softness that had been a basic part of him before, was vanished now. In its place was something grim and isolated, as if he had at last become coldly conscious of the strength and skill in him that set him apart from other men. A quality like the sheer, physical deadliness of Swahili had entered into him.

He stood without moving. When he had moved earlier, it had been almost without a sound. He seemed to carry about him now a carefulness born of the consciousness that all others were smaller and weaker than he, so that he must remember not to damage them without intent. Like someone more warrior than man, prototype of some line of invincible giants to come, he stood by Cletus's desk.



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"That's good to hear," he said softly, to Cletus, now. "What do you want me to do?"

"Fight a campaign—if necessary," said Cletus. "I'm going to give you a world to defend. And I'm promoting you two grades to a new rank—Vice Marshal. You'll be working in team with another officer also holding an entirely new rank—the rank of Battle Operator."

He turned slightly to look at Bill Athyer.

"That'll be Bill, here," he said. "As Battle Op, Bill will rank just below you and above any other officer in the field with you, except myself."

Arvid and Bill looked at each other.

"Battle Operator?" said Eachan.

"That's right," Cletus answered him. "Don't look so surprised, Eachan. This is something we've been headed toward from the start with the reorganization and retraining of the men."

He looked back at Arvid and Bill.

"The Marshal, or Vice Marshal, and the Battle Operator," Cletus said, "will form a General Commander's team. The Battle Op is the theoretical strategist of that team and the Vice Marshal is the field tactician. The two will bear roughly the same relationship to each other as an architect and a general contractor in the construction of a building. The Battle Op will first consider the strategical situation and problem, and lay out a campaign plan. And in this process he will have complete authority and freedom."

Cletus had been watching Bill in particular as he spoke. Now, he paused.

"You understand, Bill?" he said.

"Yes, sir," said Bill.

"Then," Cletus's eyes swung to Arvid, "the Battle Op will hand his strategical plan to the Vice Marshal, and from that point on, it'll be the Vice Marshal who has complete authority. His job will be to take the plan given him, make any and all alterations in it he thinks it needs for practical purposes, and then execute it as he sees fit. *You* understand, Arv?"

"Yes, sir," said Arvid, softly.

"Good," said Cletus. "Then you and Bill are released from your present duties as of now and you'll begin immediately on your new jobs. The world I'm giving you to start with is the Dorsai here, and the first force you'll be working with will be made up of the women and children, the sick, the injured, and the over-age men."

He smiled a little at them.

"Then get at it, both of you," he said. "none of us have any time to waste nowadays."

As the door to the office closed behind the two of them, a wave of the fatigue he had been holding at bay for a number of days and

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hours now, suddenly washed over him. He swayed where he stood and felt Eachan catch him by the elbow.

"No . . . it's all right—" he said. His vision cleared and he looked into Eachan's concerned face. "I'm just tired, that's all. I'll take a nap and then we'll hit things after dinner."

With Eachan following guardedly beside him, he walked out of the office-study, feeling as if he were stepping on pillows and up to his bedroom. The bed loomed before him. He dropped onto its yielding surface, without bothering even to take off his boots.

And that was the last he remembered.

He woke just before sunset, ate a light meal and spent half an hour getting reacquainted with his son. Then he closeted himself in his office with Eachan to attack the pile of paperwork. They sorted the correspondence into two piles, one which Cletus had to answer himself and one which Eachan could answer with a few words per letter of direction from him. Both men dictated until nearly dawn before the desk was cleared and the necessary orders for the Dorsai and off-world troops were issued.

The interview in the study next day with the Newtonian Chairman, Walco, was brief and bitter. The bitterness might have gone into acrimony and the interview prolong itself unduly, if Cletus had not cut short Walco's scarcely-veiled accusations.

"The contract I signed with you," said Cletus, "promised to capture Watershed and the stibnite mines, and turn them over to your own troops. We made no guarantee that you'd stay in control of the mines. Holding on to them was up to you, and to whatever agreement you could make with the Brozans."

"We made our agreement!" said Walco. "But now that they've suddenly been reinforced by fifteen thousand Alliance and Coalition troops, courtesy of this fellow de-Castries, they're refusing to honor it. They claim they made it under duress!"

"Didn't they?" Cletus said.

"That's not the point! The point is, we need you and enough troops from the Dorsai, right away, to match those fifteen thousand soldiers from Earth the Brozans are holding over us like a club."

Cletus shook his head.

"I'm sorry," he said. "I'm facing unusual demands on my available mercenaries, right now. Also, I'm not free to come to Newton, myself."

Walco's face went lumpy and hard.

"You help get us into a spot," he said, "and then when trouble comes, you leave us to face it alone. Is that what you call justice?"

"Was justice mentioned when you signed us to the original con-

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tract?" replied Cletus, grimly. "I don't remember it. If justice had been a topic, I'd have been forced to point out to you that while it was your funds and experts who developed the stibnite mine, that was only because you were in a position to take advantage of the Brozan poverty that was then keeping them from developing the mines themselves. You may have a financial interest in the mines, but the Brozans have a moral claim, which would have to be recognized by you, eventually—"

He broke off.

"Forgive me," he said, dryly. "I'm a little overworked these days. I gave up long ago doing other people's thinking for them. I've told you neither I, nor an expeditionary force of the size you ask for, is available to you, right at the moment."

There was a second's pause. Gradually the lumpiness of Walco's features smoothed out into an expression almost of despair.

"We'll take your officers," he sid, on a long exhalation of breath.

"Good. Colonel Khan will have the contract ready for you in two days. You can discuss the terms with him then," said Cletus. "And now, if you'll excuse me—"

Walco left.

Cletus called in David ap Morgan, one of Eachan's old officers, now a Senior Field Commander, and gave him the job of heading up the officers to be sent to command the troops of the Associated Advanced Communities on Newton.

". . . You can turn the job down, of course," Cletus wound up.

"You know I won't," said David ap Morgan. "What do you want me to do?"

"Thanks," said Cletus. "All right. I'm going to give you about twelve hundred and fifty men, each one bumped up at least one rank from what he's holding now. You'll have ex-noncoms to be your Force-leaders.Use them to replace all the local commissioned officers—I mean *all*. And the contract's being written to give you sole command in military matters. Be sure you keep that command. Don't take any advice from Walco and his government, under any circumstances. Tell them if they don't leave you alone, you'll pull out and come back here."

David nodded.

"Yes, sir," he said. "Any plan for the campaign?"

"Just make sure you don't fight any stand-up battles," said Cletus. "I probably don't need to tell you that. Your A.D.C. troops wouldn't be any good in a stand-up battle anyway. But even if they would be, I still wouldn't want you to fight. Tease the Alliance-Coalition forces into chasing you—and then keep them chasing. Lead them all over the map. Hit them just enough to keep them hot after you, and break

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up into guerrilla groups if they get too close. Do anything needed to keep them worried and your own casualties down as much as possible."

David nodded again.

"I think," Cletus looked at him seriously. "you'll find you'll lose seventy or eighty per cent of your A.A.C. troops through desertion in the first four to six weeks. The ones that hang on will be the ones who're starting to have faith in you. You may be able to start training them as they go to turn into fairly effective soldiers."

"I'll do that," said David. "Anything else?"

"No. Just make it as expensive for the enemy as possible," answered Cletus. "Don't hit their troops when you can avoid it. Make their casualties light, but make it expensive for them in material. The more active duty soldiers they have, the more there'll be around to miss the food, equipment and other supplies I'm counting on you to destroy, every chance you get."

"Got it," said David, and went off, whistling, to his nearby home of Fal Morgan, to pack his gear for the campaign. Like all his family, he had a fine singing voice and he also whistled sweetly and intricately. Unexpectedly, hearing that tune fade away down his entrance hall and out the front door of Grahame-House, Cletus was reminded of a song Melissa had played and sung for him, once. It was a small, sad, beautiful tune made by a young member of the ap Morgan family who had died in some campaign when Melissa had been even younger, long before Cletus had come to the Dorsai.

He could not remember it all; it dealt with the young soldier's strong memories of the house where he had grown up, remembered while he was waiting for an engagement to begin on some other world.

". . . Fal Morgan, Fal Morgan, when morning is gray,
Your wall-stones and rooftree stand near me, today . . ."

Cletus shook the emotional tag-end of recollection from his mind. He turned to the task of picking out the men he would promote and send with David.

During the weeks that followed, the demand upon the Dorsai professional soldiers continued. Everywhere that Cletus had won a campaign, the combined Alliance-Coalition forces were in action, trying to reverse whatever situation his successful actions had created.

The efforts of the forces from Earth were ponderous and awesome. Together, the Alliance and the Coalition had better than half a million military people scattered out upon the New Worlds. If the full half-million could have been

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made effective in the campaigns Dow deCastries was trying to conduct, any opposition by the Dorsais or the attacked colonies could not have lasted more than a few days in each case.

As it was, however, nearly half the half-million were engaged in military occupations other than those of a fighting live soldier, or officer. And of the more than two hundred and fifty thousand men which this left technically available for active duty in the field, more than a hundred and fifty thousand at any one time were rendered—or managed to render themselves—ineffective, through a variety of means and for a variety of causes.

Among these were deep suspicions and old rivalries between former Alliance officers and their new Coalition partners; also, laziness and inefficiency among those of all ranks and political backgrounds, and the sheer blundering that inevitably resulted from the disorganization in such a large, hastily-formed partnership of military units.

In spite of this, with all these subtractions, there remained a hard core of perhaps eighty thousand well-trained and superbly equipped troops from Earth, to face a couple of hundred thousand almost-useless and practically non-equipped local Colonial troops, plus a relative handful of Dorsais. Cletus could hardly have put twenty thousand Dorsai men in the field, even if he had scraped together every male from that small world, including walking cripples, between the ages of twelve and eighty.

Sending small contingents of Dorsais to officer Colonial troops was one solution, but only where the Colonial troops had at least a shred of training and effectiveness. Where this was not the case—as on Cassida—or where there simply were no native Colonial troops to officer—as on St. Marie—actual contingents of Dorsais had to be sent.

"But why don't we just stop?" demanded Melissa, anguished one day after she had come back from visiting a neighbor household which had lost yet another of the family's men. "Why can't we just stop sending men out?"

"For the same reason the Coalition and the Alliance have combined to send men to reverse everything we've accomplished," Cletus answered her. "If they beat us at every point, they'll destroy our value as soldiers for hire to the other Colonies. That's what Dow's really after. Then they'll come on to the Dorsai and destroy us."

"You can't be sure of that . . . that they're out to destroy us!"

"I can't be other than sure. Nor can anyone who's thought the matter through," said Cletus. "We were winning every campaign and proving ourselves superior to their own troops. A little more of that, and troops from the Alliance and the

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Coalition wouldn't be needed any more on the New Worlds. And with the need gone for any military support from Earth, there'd go Earth's influence among the Colonies. This way, if they win, they protect their hold on the New Worlds. While if we win—"

"Win!" snorted Eachan, who was in the room at the time.

"If we win," repeated Cletus, looking steadily at the older man, "we break that hold for good. It's a battle for survival between us, now. When it's over, either Earth or the Dorsai will be counted out on the New Worlds."

She stared at him, her eyes unnaturally wide, for a long moment of silence.

"I can't believe that!" she said, at last. She turned to her father. "Dad—"

"Oh, it's true enough," said Eachan flatly, from across the room. "We *were* too successful—with Cletus's early campaigns on Newton and worlds like that. We scared the Alliance and the Coalition, both. Now they're out to make themselves safe. And they're very big; and we're very small. And we've already sent out the last men we've got to send."

"They haven't any left in reserve either," said Cletus.

Eachan said nothing. Melissa turned back to Cletus.

"No," said Cletus, although she had not spoken, "I don't intend to lose."

Eachan still did not comment.

In the silence, distantly, the front door annunciator chimed. A second later, an aide opened the door.

"Rebon, Exotic Outbond to the Dorsai, sir," he said.

"Bring him in," said Cletus. The aide stood aside and a slight man in blue robes entered the room.

His face held the eternal Exotic calm, but his expression was serious nonetheless. He came up to Cletus, as both Cletus and Eachan got to their feet.

"I've got some bad news I'm afraid, Cletus," he said. "A military force of the Alliance-Coalition Peace Force has seized the Maran Power Tap side and all the equipment and technicians there."

"On what basis?" snapped Eachan.

"The Coalition has filed claims against the Associated Advanced Communities of Newton," said Rebon, turning slightly to face Eachan. "They've seized the Power Tap Site as an A.A.C. asset pending settlement of their claim. Mondar"—he turned back to Cletus—"asks your help."

"When did this happen?" asked Cletus.

"Eight hours ago," said Rebon.

"Eight hours!" exploded Eachan. The fastest spaceship—and there was no known swifter way of transmitting messages across interstellar space—required at least three days to cover the light-years

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between Mara and the Dorsai. Rebon's eyes veiled themselves slightly.

"I assure you it's true," he murmured.

"And where'd the troops come from?" demanded Eachan. He threw a glance at Cletus. "They weren't supposed to have any more available!"

"From the Friendlies, undoubtedly," replied Cletus.

Rebon lifted his gaze back to Cletus, slowly.

"That's true," he said, on a note of surprise. "You expected this?"

"I expected deCastries to hire help from Harmony or Association eventually," said Cletus, brusquely. "I'll leave right away."

"For the Power Tap Site on Mara?" Relief sounded in Rebon's voice. "You *can* raise men to help us, then?"

"No. Alone. For Kultis," said Cletus, already striding out of the room, "to talk to Mondar."

Boarding the spaceship that would take him to Kultis, he encountered at the foot of the boarding ladder Vice Marshal Arvid Johnson and Battle Operator William Athyer, who had been ordered to meet him here. Cletus stopped for a moment to speak to the two men.

"Well," said Cletus, "do you still have any notion I gave you a nothing job when I put you in charge of defending the Dorsai?"

"No, sir." Arvid looked calmly at him.

"Good. It's up to you then," said Cletus. "You know the principles behind whatever action you'll need to take. Good luck."

"Thank you," said Bill. "Good luck to you, too, sir."

"I make it a point not to know the lady," said Cletus. "I can't afford to count on her."

He went up the boarding ladder and the entry port of the ship closed behind him.

Five minutes later it leaped skyward in thunder and was lost into space.

XXV

Mondar had changed in some indefinable way, since Cletus had seen him last, when they met again in Mondar's garden-enclosed residence in Bakhalla. There were no new lines in the calm fare, no touch of gray in the Exotic's hair; but the blue eyes like Melissa's were becoming strangely deeper in color as if the time that had passed since their last encounter had dredged new levels of understanding in the mind behind.

"You can't help us on Mara, then, Cletus?" were the words with which he greeted Cletus on the latter's arrival.

"I don't have any more troops to send," said Cletus. "And if I had, I'd strongly suggest we didn't send them."

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They passed through the halls of Mondar's house, walking side by side and emerged into an enclosure half-room, half-arbor, where Mondar waved Cletus to a wide, basket-weave chair, and took one like it himself. All this time Mondar had not spoken, but now he did.

"We stand to lose more than we can afford, if we lose our present investment in the Power Tap," said Mondar. "We've still got a contingent of your Dorsais here in Bakhalla. Can't we use some of them to retake the Power Tap Site?"

"Not unless you want the additional Alliance-Coalition troops that've been put into Neuland to come boiling over the border into your colony, here," said Cletus. "You don't want that, do you?"

"No," said Mondar. "We don't want that. But what's to be done about the Friendly mercenaries occupying the Power Tap Site?"

"Leave them there," said Cletus.

Mondar gazed at him.

"Cletus—" he said after a second, softly, "you aren't just trying to justify this situation you've created?"

"Do you trust my judgment?" countered Cletus.

"I've got a high regard for it," slowly answered Mondar, "—personally. But I'm afraid that most of the other Bonds here and in the Maran Colonies of our people don't share that high regard, at the moment."

"But they still trust you to make the decisions about me, don't they?" asked Cletus.

Mondar gazed at him, curiously.

"What makes you so sure of that?" he asked.

"The fact I've gotten everything I've ever asked the Exotics for, through you—up until now," answered Cletus. "You're the man who has to recommend me as a bad bet or a good one, aren't you?"

"Yes," said Mondar, with something of a sigh, "and that's why I'm afraid you won't find me as personally partial to you now as I might be, Cletus. I've got a responsibility to my fellow-Exotics now that makes me take a harder view of the situation than I might take by myself. Also, I've got a responsibility to come to some kind of a decision, now, between you and the Alliance-Coalition combination."

"What's the procedure if you decide for them—and against us?" asked Cletus.

"I'm afraid we'd have to come to the best possible terms with them that we could," Mondar answered. "Undoubtedly they'd want us to do more than dismiss the troops we've now got in hire from you, and call in your loan. They'd want us to actively throw our support on their side, hire their troops, and help them against you on the Dorsai."

Cletus nodded.

"Yes, that's what they'd want," he said. "All right, what do you need to decide to stick with the Dorsai?"

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"Some indication the Dorsai stands a chance of surviving the present situation," said Mondar. "To begin with, I've told you we face a severe loss in the case of the Maran Power Tap; and you said just now even if you had the troops to spare, you'd suggest doing nothing about the Alliance-Coalition occupation of the Site. You must have some reasoning to back that suggestion?"

"Certainly," said Cletus. "If you stop and think for a moment, you'll realize the Power Tap Project itself is perfectly safe. It's a structure with both potential and actual value—to the Alliance and Coalition, as well to anyone else. Maybe they've occupied the Site; but you can be sure they aren't going to damage the work done so far by the men or machines that can finish it."

"But what good will that do us, if it stays in their hands?"

"It won't stay long," said Cletus. "The occupying troops are Friendlies and their religious, cultural discipline makes them excellent occupying troops—but that's all. They look down their noses at the very people who hire them; and the minute their pay stops coming they'll pack up and go home. So wait a week. At the end of that time either Dow will have won, or I will. If he's won, you can still make terms with him. If I've won, your Friendlies will pack up and leave at a word from me."

Mondar looked at him narrowly.

"Why do you say a week?" he asked.

"Because it won't be longer than that," Cletus answered. "Dow's hiring of Friendly troops gives away the fact that he's ready for a showdown."

"It does?" Mondar's eyes were still closely watching him. Cletus met them squarely with his own gaze.

"That's right," he said. "We know the number of the available field troops in the Alliance-Coalition force that Dow's put together. It can be estimated from what we already knew of the number of troops the Alliance and the Coalition had out on the New Worlds, separately. Dow had to use all of them to start enough brush wars to tie up all my Dorsais. He hadn't any spare fighting men. But, by replacing his fighting troops with Friendlies, he can temporarily withdraw a force great enough, in theory, to destroy me. Therefore the appearance of Friendly troops under Dow's command can only mean he's forming such a showdown force."

"You can't be sure his hiring of Friendlies as mercenaries means just that, and not something else."

"Of course I can," said Cletus. "After all, I was the one who suggested the use of the Friendly troops in that way."

"*You* suggested?" Mondar stared.

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"In effect," said Cletus. "I stopped off at Harmony myself some time back, to talk to James Arm-of-the-Lord and suggest he hire out members of his militant church as raw material to fill uniforms and swell the official numbers of my Dorsais. I offered him a low price for the men. It hardly took any imagination to foresee that once the idea'd been suggested to him, he'd turn around as soon as I'd left and try to get a higher price from Dow for the same men, used the same way."

"And Dow, of course, with Alliance and Coalition money, could pay a higher price," said Mondar, thoughtfully. "But, if that's true, why didn't Dow hire them earlier?"

"Because exposing them to conflicts with my Dorsais would have quickly given away the fact the Friendlies hadn't any real military skills," replied Cletus. "Dow's best use of them could only come from putting them into uniform briefly, to replace the elite Alliance-Association troops he wanted to withdraw secretly, for a final battle to settle all matters."

"You seem," said Mondar, slowly, "very sure of all this, Cletus."

"That's natural enough," said Cletus, "it's what I've been pointing toward ever since I sat down at the table with Dow and the rest of you on board the spaceship to Kultis."

Mondar raised his eyebrows.

"That much planning and executing?" he said. "Still, it doesn't mean you can be absolutely sure Dow will do what you think he'll do."

"Nothing's absolutely sure, of course," said Cletus. "But for practical purposes I'm sure enough. Can you get your fellow Exotics to hold off action on the occupation of the Maran Core Tap Site for seven days?"

Mondar hesitated.

"I think so," he said. "For seven days, anyway. Meanwhile, what are you going to do?"

"Wait," said Cletus.

"Here?" said Mondar. "With Dow, according to your estimate, gathering his best troops to strike? I'm surprised you left the Dorsai to come here in the first place."

"No need to be surprised," said Cletus. "You know I know that the Exotics somehow seem to get information of events on other worlds faster than the fastest spaceship can bring it. It merely seemed to me that information might reach me as fast here, as it would any place. Would you say I was wrong?"

Mondar smiled slightly.

"No," he answered. "I'd have to say you weren't wrong. Be my guest, then, while you wait."

"Thank you," said Cletus.

Mondar's guest, then, he remained. For three days during which he inspected the Dorsai troops in Bakhalla, browsed in that local library that had been the scene of Bill Athyer's discovery of

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a new occupation life, and renewed his old acquaintance with Wefer Linet.

On the morning of the fourth day, as he and Mondar were having breakfast together, a young Exotic in a green robe brought in a paper which he handed to Mondar without a word. Mondar glanced at it and passed it over to Cletus.

"Dow and fifteen shiploads of Coalition elite troops," Mondar said, "landed on the Dorsai two days ago. They've occupied the planet."

Cletus got to his feet.

"What now?" Mondar looked up at him from the table. "There's nothing you can do now. Without the Dorsai, what have you got?"

"What did I have before I had the Dorsai?" retorted Cletus. "Dow wants me, Mondar—not the Dorsai. And as long as I'm able to operate, he hasn't won. I'll be leaving for the Dorsai immediately."

Mondar got to his feet.

"I'll go with you," he said.

XXVI

The shuttleboat, with the Exotic sunburst emblem inlaid on its metal side was allowed to land without protest on the Dorsai at the Foralie shuttleboat pad. But on emerging with Mondar, Cletus was immediately disarmed of sidearm by competent looking and obviously veteran troops in Coalition uniforms, with the white band of the Alliance-Coalition Joint Force fastened about their right sleeves. The same soldiers escorted the men through a Foralie town where none of the local people were to be seen—only the occupying soldiers—to a military atmosphere craft that flew them up to Grahame-House.

Word of their arrival had obviously been sent ahead. They were escorted to the door of the main lounge of the house, ushered inside and the door closed firmly behind them. Within, seated with drinks in which they obviously had little interest, were Melissa and Eachan; in their stiffness and unnaturalness, like set-pieces arranged to show off Dow deCastries, slim in the gray-white Coalition uniform, standing beside the bar at the far end of the room with a drink also in his hand.

Across the room Swahili, also in Coalition uniform, stood holding a heavy energy handgun.

"Hello, Cletus," Dow said. "I was expecting to find you here when I landed. I'm surprised you came on in when you saw my transports in orbit. Or didn't you think we'd have occupied all of the Dorsai, yet?"

"I knew you had," said Cletus.

"But you came in anyway? I wouldn't have," said Dow. He raised his drink, and sipped from it. "Or did you come down to trade yourself if I'd turn the Dorsai loose? If you did, that was foolish. I'm going to turn it loose anyway.

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All you've done is save me the trouble of hunting you down on some other world. I've got to take you back to Earth, you know."

"To be sure," said Cletus. "So I can have a trial. Which will end in a death sentence. Which you can commute to life imprisonment—after which I'll be imprisoned secretly somewhere, and eventually just disappear."

"Exactly right," said Dow.

Cletus looked at the watch on his wrist.

"How long is it since your scanning screens picked up the approach of the spaceship I came in?" he asked.

"About six hours." Dow put his drink down and straightened up. "Don't tell me you came in here expecting to be rescued? Maybe the handful of officers you left here do have a screen that picked your ship up, and maybe they did know it was you aboard her. But, Cletus, we've been chasing them twenty-four hours a day since I brought my troops in here. They're too busy running to worry about you, even if they had enough men and guns to do something."

He stared at Cletus for a second.

"All the same," he said, turning to Swahili, "we won't take any chances. Go give the local commander my orders to set up a security cordon to the shuttleboat landing pad in Foralie. And order a shuttle down from one of the transports. We'll get Grahame aboard as soon as possible." He looked back at Cletus. "I'm not going to start underestimating you now."

Swahili went out, handing his weapon to Dow and closing the door carefully behind him.

"You've never stopped underestimating me," said Cletus. "That's what brought you here."

Dow smiled.

"No. What I'm saying is quite true," said Cletus. "I needed a lever to change history and I picked you. From the time I sat down at your table on the ship to Kultis, I was busy working you into this situation."

Dow leaned the elbow holding the heavy handgun on the bar beside him, keeping its muzzle pointed steadily at Cletus.

"Move a few feet away from him, Mondar," Dow said, to the Exotic who had been standing beside and a little behind Cletus all this time. "I can't imagine you sacrificing yourself to give him a chance to escape, but there's no point in risking it."

Mondar moved.

"Go on, Cletus," said Dow. "We've got a few moments to wait anyway. I don't believe what you're saying, at all, but if there's even a slight chance you've been able to maneuver me, I want to know about it."

"There's not much to tell," said Cletus. "I started out first by at-

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tracting your attention to myself. Then I showed you I had military genius. Then I began to make a name for myself on all the New Worlds, knowing this would suggest an idea to you—the idea you could use what I was doing as an excuse to get what you wanted for yourself."

"And what was that?" The gun in Dow's hand was steady.

"Personal control of both the Alliance and the Coalition—and through them the New Worlds," answered Cletus. "You talked up my successes on the New Worlds as a threat to both the Alliance and the Coalition, until they agreed to combine their outworld forces and put you in command of them. Once in command, you thought all you needed was to stretch the Dorsais out so thin you could defeat them. Then you'd capture me and use your popularity and military power to put military juntas in place of the political leaders at the head of both the Coalition and Alliance, back on Earth. Naturally, the generals you picked for the military juntas would be your men—and in time they'd be yielding the government of all Earth to you."

Swahili came back into the room. Dow handed him the handgun and, carefully covering Cletus all the while, Swahili crossed once more to his position on the other side of the room.

"How long?" Dow asked him.

"Twenty minutes," Swahili answered. Dow looked thoughtfully back at Cletus.

"Maybe a trial would be too much of a risk after all—"

He broke off. There were shouts, and the sharp, chorused whistling of some rifles outside the house, followed by the heavy sizzle of at least one energy weapon. Swahili ran toward the door of the room.

"No!" snapped Dow. Swahili checked and spun about. Dow pointed at Cletus. "Shoot him!"

Swahili brought the energy handgun up and there was a sound like the snapping of a small stick. Swahili checked abruptly, turning toward Eachan, who was still sitting in his chair, but now holding the same flat little handgun—minus the long sniper's barrel—that he had used long ago from under the overturned command car, in which he, with Melissa, Mondar and Cletus, had been trapped on the road to Bakhalla.

Swahili went suddenly, heavily, to his knees on the carpet. The energy pistol dropped from his grasp. He fell over on his side and lay there. Dow moved sharply toward the fallen weapon.

"Don't!" said Eachan. Dow stopped abruptly. There were more sounds of voices shouting outside.

Eachan got to his feet and walked across to the fallen energy weapon, still holding his own pistol. He picked up the fallen gun and bent over Swahili, who was breathing raggedly.

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"Sorry, Raoul," Eachan said, gently.

Swahili looked up at him and almost smiled. The almost-smile continued and did not change. Eachan reached down in an old-fashioned gesture and softly closed the lids over the unmoving eyes. He straightened up, as the door burst open and Arvid, a cone rifle in one large hand, strode into the room closely followed by Bill Athyer.

"All right, here?" said Arvid, looking at Cletus.

"All right, Arv," Cletus answered. "How about outside?"

"We've got them all," Arvid answered.

"You'd better start running in a hurry, then," said Dow, dryly. "All these detachments of mine are in constant open-channel communication with each other. There'll be other detachments moving in here within minutes. And where are you going to run to?"

"We're not going to run at all." Arvid looked at him. "All your troops on the Dorsai are now captured."

Dow stared at him. Black eyes locked with pale blond.

"I don't believe it," Dow said, flatly. "There are only women, children and old men left on this world."

"What of it?" Cletus asked. Dow turned to look at him. Cletus went on. "Don't you believe I could defeat a few thousand Coalition elite troops with a world-full of women, old men and children to help me?"

Dow regarded him for a long second without speaking.

"Yes," he said at last. "You, Cletus—I believe you could do it. But you weren't here." He lifted his right hand and pointed his index finger at Cletus. "The thing you forget—"

There was a little, momentary soundless, puff of white vapor from the sleeve of his jacket. What felt like a sledgehammer smashed into Cletus's upper right chest. He stumbled backward and the edge of a table stopped him from falling.

Arvid took one long, swift pace toward Dow, his nearer hand flinging up, and staring to descend, edge-on.

"Don't kill him!" snapped Cletus, with what little breath was left in him.

Arvid's hand changed direction in mid-air. It came down to close on Dow's outstretched arm. He peeled back the sleeve, and they all saw a dead-man's tube, a reflex single-dart thrower, strapped to Dow's wrist. Arvid broke the strap-fastening loose and tossed the tube into a corner of the room. He caught up Dow's other arm and peeled the sleeve back, but the wrist on that side was bare.

"Don't move at all," Arvid said to Dow, and stepped back from him. Melissa was already at Cletus's side.

"You must lie down," she said.

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"No." He shook his head, resisting the pull of her hands. He could not feel the extent of the damage from the shock-point of the dart, but his right upper body was numb and a weak dizziness was threatening to overwhelm him. He fought it back with all the strength of physiological discipline he had. "There's something I've got to tell him."

He leaned gratefully back against the supporting edge of the tabletop behind him.

"Listen to me, Dow," he said. "I'm going to send you back to Earth. We'll not kill you."

Dow looked at him fearlessly and almost curiously.

"If that's so, I'm sorry I shot you," he said. "I thought I was on my way out and might as well take you with me. But why send me back to Earth? You know I'll just raise another army and come back. And next time I'll beat you."

"No.'" Cletus shook his head. "Earth's lost its influence on the New Worlds. You'll tell them that, back there. From now on any colony can hire half the number of Dorsai troops that the Alliance or the Coalition supplied to their enemy—and defeat the Earth troops, easily. The Dorsais will always win, and any colony can afford to hire them."

Dow frowned.

"It's you that make Dorsais potent," he said. "And you won't last forever."

"But I will." Cletus had to pause to fight off the encroaching dizziness, again. Barely, once more, he won the battle and went on. "Just as you said—I wasn't here when you landed. And a planetful of women, children and oldsters beat you. That's because I was as good as here. You see these two?"

He nodded weakly toward Arvid and Bill.

"There're the two parts of me," he said, almost whispering now. "The theoretician and the field general. The only orders I left them was to defend the Dorsai. But they defended it just the way I would have—right down to being here when I knew they would, to rescue me from you. There's no end to the Dorsais, now. Earth won't ever have troops able to beat them."

The dizziness surged in on him and he forced it back.

". . . Why?" he heard Dow saying. He looked about for the man and saw the lean face under the black hair and graying temples floating as if on a field of mist.

"It's time for the New Worlds to go free," Cletus said. "They have to break loose from the Alliance, the Coalition—from all Earth, and make themselves into what they're meant to be. It was time. I did it."

". . . Because of the books you wanted to write, you said." Dow's voice faded out almost to nothingness and then roared like the sound of surf on his ears.

"That . . . too . . ." Cletus held

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hard to the table edge behind him with both hands, for the floor was threatening to dissolve under his feet. "The last sixteen volumes will be tactics only as Dorsais-to-come can use. No use to ordinary military, back on Earth. Only with a new sort of soldier . . . with restraint . . . obligation . . . mind and body—"

There was no more.

After what seemed many centuries of nothingness he drifted back to fuzzy consciousness to find himself lying on a bed. A young commandant wearing medical insignia was just finishing a broad bandage across his upper chest; and behind the commandant stood Melissa and Mondar.

"I'm not dead, then . . .?" he asked.

"Dow used the wrong weapon on you, Cletus," said Mondar. "Darts that trigger a state of physical shock and collapse are all right for killing ordinary men, but not one like you who's trained his physiological processes to obey his will, automatically. You're going to live . . . isn't he, doctor?"

"Absolutely." The medical commandant straightened up and stepped back from the bedside. "He should have died on his feet within the first minute and a half after he was hit. When he got past that point, there was no place for his system to go but toward recovery."

He handed a hypospray arm band to Melissa.

"See that he does a lot of sleeping," he said. "Come on, Outbond."

The figures of the two men moved out from Cletus's field of vision. He heard a door close at a little distance. Melissa sat down in the chair the doctor had occupied and began to strap the hypospray around Cletus's sleeveless right arm.

"You don't have to do that," he whispered to her. "You can go now, to Earth or anywhere you want. It's all over."

"Don't talk," she said. "It's all nonsense, anyway. If I'd wanted to go, I'd have gone right after you made me marry you. I could have dreamed up some excuse—to explain it to Dad. You know he'd believe anything I told him."

He stared at her.

"Then why didn't . . ."

"Because you told me you loved me," she said. "That was all I wanted to know."

He rolled his head a little, weakly and negatively, on the pillow.

"I said . . ."

She finished strapping the hypospray on his wrist and bent down and kissed him, stopping the words on his lips.

"You idiot!" she said, fiercely and tenderly. "You magnificent, genius-idiot! Do you think I paid any attention to what you *said*?" ■

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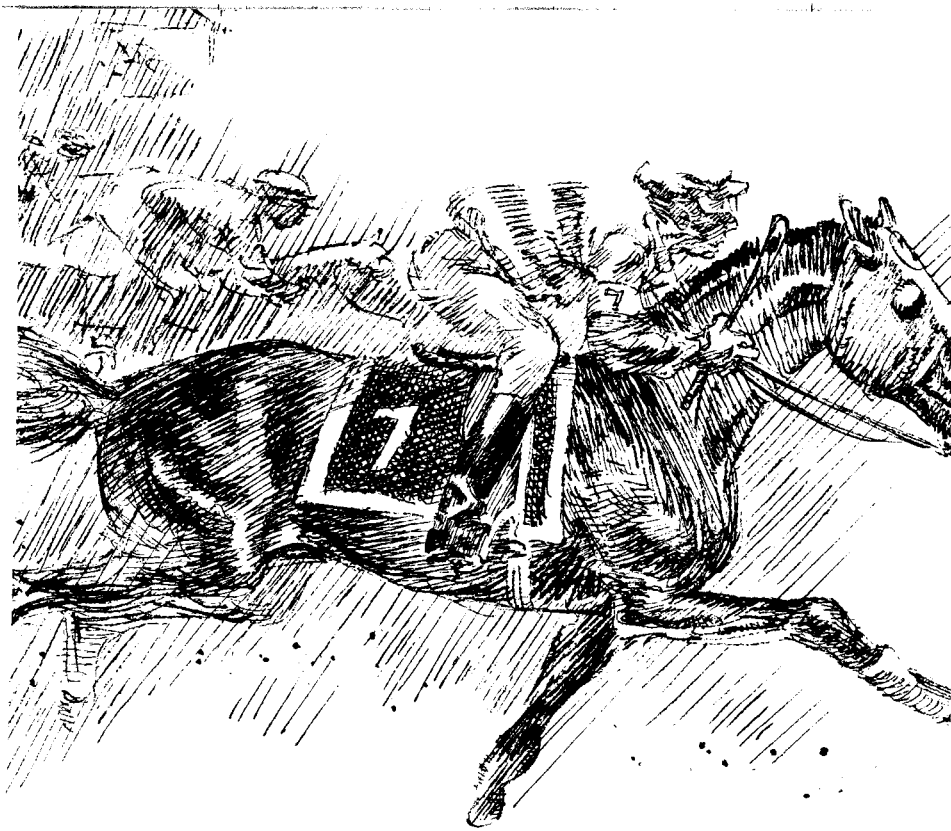

SPROG

It wouldn't make a bit of difference
what method was used, as long as it worked.
But, of course, if it worked
it would have to be useless . . .

JACK WODHAMS
Illustrated by Leo Summers

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Johan Sebastian Schmidt found it extremely difficult to cash in. After laboring so long, so frugally, so meticulously to ensure an exactitude of perfection, he had expected a much more enthusiastic response. Precision had been his goal, an elimination of error to its most inconsequential fraction, the measure of guesswork to be so reduced as to be a factor irrelevant to the issue, a factor unworthy of consideration.

Precision. Anything less than unqualified ninety-nine percent accuracy would have been unacceptable to him, would, he felt, have left him open to being categorized with the many and general inferior practitioners of the art. It was the element of humbug that he most heartily wished to eschew. To succeed, he had determined from the outset, he had to clearly and decisively be unequivocally specific. His results had to be consistently and unarguably correct. And this he had finally achieved.

Scientific, coded and cross-referenced to the nth degree, Johan Sebastian Schmidt, as from a bad smell, had as far removed himself from the ambiguities and procrastinating techniques of his contemporaries and predecessors as it was possible to get. He had worked, and the gulf he had established between his elegant and definitive calculations and the slipshod methods of others was a creation that he had striven to make as wide as possible. Indisputable. Undeniable. Scientific.

Not until he was sure, not until he was positive, not until he was absolutely certain that he could withstand challenge with equanimity did Johan Sebastian Schmidt step forth, his ultimate triumph overcoming modesty, to announce to the world his stupendous discovery.

And, "Oh-ha," was the reaction he got. And, "So what else is new?" But . . . But . . . didn't they realiize? Didn't they understand? "Yeah, yeah, buddy, very interesting—now move along and give the next guy a chance." But . . . "Go parade your poodle in someone else's park, hey, fella? Out!"

Out. Unreceptive. It was incredible.

Johan temporarily dropped his scale of fees—that started from one hundred dollars and went on up. For publicity he offered to give free demonstration. This generous gesture itself received no free space, and Johan was somewhat chagrined to have to actually pay to make known his offer of a free public trial. But the testimonials he would gain, Johan thought, would justify the outlay. The voices of treated applicants would provide irrefutable proof that could not fail to attract attention.

Poor Johan. What customers he got proved to be mainly women, with a large gap in the preponderance showing between the

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very youthful, and the middle-aged and older. They were not, broadly speaking, the type and quality of persons to have their opinions seized upon as having undoubted authority and validity.

Also, as it turned out, many of those who volunteered did not comment as favorably on the experience as Johan had anticipated. Some, indeed, were downright unappreciative. Johan's system was not at all what they were accustomed to. As one young lady declared indignantly, "I am not, I don't intend to be, and I won't be. I'm a decent clean-living girl! The nerve of that guy!" As one flustered matron muttered as she hurriedly departed, "It's disgraceful telling people things like that. He should mind his own business!"

As with any other shy, retiring, normal nonentity, Johan Sebastian Schmidt longed for recognition. He had thought that acclaim would automatically have followed the revelation of his complete and very thorough investigations and formulations. He was aggravated in his disappointment.

Some people had such a simple idea, a wonderful idea, and went on from there to develop the notion and to parley it into a fortune—without much seeming opposition. Look at the inventor of the safety pin, the fashioner of the preserving jar, the designer of the ball pen, the maker of the breadslicer. And those who fancied up their gadgets around a basic principle to fabricate such things as hand looms, sewing machines, and duplicating contrivances. And then look at the men who discovered something that was there all the time, to harness their discovery and claim it as their own, to win fame thereby and much consequent profit. A discoverer such as Marconi, for instance—sending a voice over a distance, with nothing in-between. Could there be a concept more ridiculous than that?

It might be thought, in this modern age of everyday miracles where the refutation of the established has become regular and commonplace, that skepticism would be a vanished art, the portrayal of which would reveal its practitioner as being himself an old-fashioned fuddy-duddy who ought to know better. But this is not so. Despite a long history wherein sneerers and detractors have time and again been proved perceptually wanting in foresight, still there are those who would criticize and doubt when a great new discovery is brought to their notice.

A flying start that does not materialize, the wave that is anticipated to sweep, pick up and carry on of its own accord to ever higher crests—but breaks instead to a scarcely discernible ripple—such eventualities can leave a blithely hopeful man flat-footed and stranded.

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Johan Sebastian Schmidt was at first dismayed, and then grieved. But he was far from being defeated. He refused adamantly to join the ranks of his considered lessers. He girded his loins, changed his tack, put on full sail, and tried another approach.

"You have discovered *what* waves?"

"Not discovered but surpassingly interpreted, sir. In relation to the inner and outer ionosphere, they're not waves, exactly. You see, the formation, density, absorption and distorting reflectivity of the Van Allen belts is compensated and correlated with gravitational forces impinging from many sources at varied directional strengths. Allied with these, of course, are the numerous magnetic influences, both from our own . . ."

"Yes, yes, yes," the Assistant to the Assistant to the Secretary to the Minister for Industry impatiently guillotined the flow, "come to the point. Have you some new and better device for measuring and detecting them?"

"What? Oh no. I have adapted and modified existing sensory instruments. They're perfectly adequate for the task. It is their arrangement and capacity to record the entire spectrum of motivational progressions that has enabled me to program my two-way extrapolator. By this means over a period of time I have constructed an exact log of determinants, and it is *this* which is the infallible basis for the reliability of my projections."

"And what do you project? Are you a business consultant, or adviser? Or is it a gimmick for long-range weather forecasting?"

"It can be either, or both, and more," Johan assured him. "The permutations are infinite, but any selection for any one particular time may be chosen as desired with ease."

"Is that so? You're just random? You don't specialize in any area?"

"It can be employed to specialize in any area that may be required," Johan said.

"Is that right? Accurate, you said? Can it be applied to our export situation?"

"Certainly." Johan lacked not confidence. "Give me four or five persons whose interests are deeply concerned with exports, plus a critical date that may be of special importance, and I shall examine them and evaluate for you the cause for their condition at that time."

"Huh? Four or . . . ? What are you talking about? Some future time?"

"Yes. Any time you may wish, to the hour. Their attitudes should be quite plain to read, and the indications for their condition should be reasonably apparent. Cross checking will ensure beyond question . . ."

"You mean you just take people, anybody, and work on *them*? No

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statistics, consumer reports, market fluctuations?"

"Such things are not necessary," Johan said firmly. "It is the people involved with such things who naturally are most affected by such things. It is their situation that will have most bearing at that time, that will reveal to us the state of affairs that obtains."

The A to the A to the S to the M of I screwed up his face. "Let me get this straight. Are you saying you can take five fellows in export work, do your thing with this gizmo of yours, and come up with what they'll be doing six months from now?"

"Essentially—yes."

"You mean," and the government man started to go red, "that your angle is some kind of crystal ball? Some kind of gadget that looks into the future? The *personal* future of people?"

"Fundamentally—yes. But it is, of course, far removed from the guesswork of . . ."

"Quiet!" the man shouted, his blood pressure mounting. "Are you peddling horoscopes?"

"Not horoscopes in that sense that the term has unfortunately come to infer. The derivations I achieve from emotional parallelism and comparison, is pre-ordained by the unique combination that comprises the individual-to-ultra-environmental influences. Any test may be applied to prove the soundness of . . ."

"Get out of here!" the official bawled. "Radkin! Where are you? What do you mean by letting this crank in here? Get him out! Out!"

Johan tried to protest, but the signs that his interview was over were unmistakable and overwhelming. Upright wrath, veins bulging at temples, the arm outflung, finger pointing. "Out!"

With what dignity he could muster, Johan permitted the chastened Radkin to show him to the door.

Johan next tried the Ministry for Defense.

For several days in a row he visited the Defense Ministry promptly at opening time, to seek a hearing, to meet excuses, to be shown into an anteroom, to, with impatient patience, wait with others for a turn to speak.

He sat and fretted. His turn never seemed to come. Others came and went, and later arrivals were attended to ahead of him.

He waited. He ate his sandwiches and drank his coffee. His mind became obsessed with waiting. He nursed momentous information, but people still behaved as though nothing of importance had happened. It seemed fantastic that no one could *see*, or could at once comprehend. Nowhere could he seem to make contact with the positive lead of his electrifying computations, to be able to impart so much as a tickle. His urgent sincerity evoked pleasant politeness

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and the assurance that he would be given an audience just as soon as there was time to fit him into a slot that might fall vacant in a very busy schedule.

He waited. It was difficult to endure. In midafternoon of the third day he broke, jumped up to grasp the sleeve of a frequently-passing minor official who seemed to have entrée everywhere. Johan asked, demanded, pleaded. The junior was annoyed, but diplomatically soothing. The reception desk again. Another room. Smaller. By himself. No passersby. Waiting.

With the obstinacy of a man at the end of his road and with nowhere else to go, Johan persisted with his visits to the Defense Ministry for five days.

The fifth day, Monday, proved to the Ministry staff that they had a tough one on their hands, one that had refused to go away after the two-day weekend break. So just before closing time a senior clerk was delegated to handle the affair—just as soon as the boss on his early departure had left his office free.

The senior clerk listened and fidgeted. He was a tall thin man, and no actor. This sort of thing always made him feel put upon, and his air of harassment was genuine. It was, naturally, very effective.

"Yes, Mr. Schmidt, all very interesting, but I cannot see that we may gain any tactical advantage by knowing what is foreordained to happen. If events transpire as you predict, then, win or lose, there seems little we could do about it. If your predictions persuade us to take another course to achieve a different result, then, very obviously, your predictions must consequently be rendered inaccurate."

"The advantages lie in being forewarned," Johan said. "Knowing what is in store, we can be prepared, take steps to counter and offset the worst effects, and take the fullest advantage of the more propitious times."

The senior clerk blinked behind his glasses. "It would still seem to imply an alteration in destiny," he argued. "If you prophesy that we shall be happy at a certain time, and we take steps to be even happier, then your prophecy will again be inherently at fault in its intensity."

"Uh, not necessarily," Johan said. "The intensity will be as foretold due to the influence and foreknowledge provided by the prevision."

"But if your prevision of a high-intensity is caused by your foreknowledge of a low-intensity, then you have to have a foreknowledge of the low-intensity in order that it might be amplified to become a high-intensity. Thus, in one way or the other, your precognition system will be in error."

"We must use our common sense," Johan defended. He was

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sweating. "This is knowledge, *extra* knowledge. Forewarned is forearmed, is it not?"

The senior clerk fiddled with some papers on the desk. He really did have better things to do. It was irritating that the Under Secretary kept passing such chores on to him. "Let me put it this way—if you predict a conflict, a battle, say, in which we lose, suffering three hundred casualties, of what benefit to us is the forecast if it cannot be used to *win* the battle and cut the casualty figures? And if the prediction *is* used to win the battle, then we win the battle and the prediction is proved wrong. Yet without the aid of the prediction that we'll lose, we would not take special measures to ensure that we win. On the other hand, if you predict that we will win because we have been forewarned that we will lose, then we should probably succumb to an enemy through sheer confusion, not knowing whether we were supposed to win or not. Either way you could claim success, no doubt, but how actually usefully helpful such advice may be is, I fancy, a highly debatable point."

"You don't understand," there was an edge of desperation in Johan's voice, "there are balancing factors. Such a battle might prove to be unavoidable, but our very foreknowing might be why there are only three hundred casualties instead of three thousand. The foreknowing is vital. It evens things, you see—let's us know what to expect. Disasters can become minimized simply because we *can* foresee them and so lessen their impact. We cannot stop an earthquake, but we *can* predict that only a handful of careless people will die, the inevitable few who will always be heedless of warnings—looters, perhaps.

"The future foretold is a future that still has to be achieved, still has to be worked for. The foreknowing can give us heart that we *will* succeed, and this insight will work directly to bring about the circumstances foreseen. Can't you see the direct benefit this will be?"

"Quite frankly, no." It was getting near quitting time, and the senior clerk still had to keep tabs on *his* underlings. "The reverse is equally true. Foreknowledge of a setback can be made foreknowledge of a *bad* setback, because accurate forecasting will precondition people to apathy in the face of the inescapable known and impossible-to-change destiny. For example, if what you can foretell consistently transpires so, thus to give your pronouncements inexorable veracity, then your assertion that there will be a depression would aggravate rather than ameliorate that circumstance. What could anybody do about it? People would think: It is Fate."

The senior clerk pushed his papers aside and stood up. "Fate can

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be bad enough when it comes by surprise. To learn well beforehand that there is no chance anyway is not an asset to anticipation." Adjusting his glasses he came around the desk. "Thank you for coming to us, Mr. Schmidt. We appreciate your bringing this system to our attention. However, at this time we are already over-budget on our commitment to various projects, and I am sure that you will understand that yours is but one of many developments that constantly are being brought to our notice."

The senior clerk held out his hand. "Your idea will be recorded and filed, for reference and review," he lied. "Should we require your services we will get in touch." His smile was faint. "We never can tell around here."

Numbly Johan gave his hand to a brief shake. "But . . ." he was reduced to monosyllables, "Look . . . Wait . . ." Helplessly he found himself on his way out.

"Thank you, Mr. Schmidt. Have you thought of trying the women's magazines? Good day, Mr. Schmidt . . ."

Johan's visits to the Ministry of Defense had not gone altogether unremarked. The opposition had been made curious. After all, a thick-set, neatly-dressed rather stern-faced stranger arriving on time each day at opening time, to remain until that department closed—this merited investigation.

The opposition thus routinely made a couple or so discreet inquiries, to be aided to discover that this earnest and punctual man was some sort of scientist with a brainchild to submit for examination. His regularity, his sober appearance, his *dis*appearance inside the building to what unknown secret closet—this in association with the Defense Ministry—well, a person did not have to be a spy to find the adding of two-and-two intriguing.

So it was that when Johan, deeply discouraged, left the building after at last being granted an interview, he unknowingly picked up company.

Johan was well in the mood to respond to a sympathetic ear. And his new-found friend, Tuic—he could not recall exactly how they had met; it had been after dinner, a matter of a wrong hat, apologies, drinks—was a very attentive listener indeed.

"Here it is," Johan said. His flattering new chum had kindly accepted an invitation to view. Johan patted his computer as a man might pat his undeservedly ill-treated dog. "SPROG. My fully unified and fully inter-referential Scientific Prognosticator." He shucked his raincoat and threw it across a nearby bench. "You wanted to see it, well—there it is."

Tuic did a short prowl, looking the machine over. He kept his raincoat on—he wanted to be dis-

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arming, but not *that* disarming. "It is quite imposing," he said.

"It's only an ordinary computer with a couple of special attachments." Johan frowned in morose study. "It's not the machine—it's the information that the machine holds, and the way that it is programmed to use that information."

"Of course," Tuic said. "And, ah, what does this information consist of, mainly?"

"This machine holds all the information upon every celestial body and influence. The plane, the motion, the forces that any one body or power may exert, is taken into account in regard to every other force that applies at any given moment of time. We are subject every minute of our lives to the infinitesimal-seeming pull and tug of spherically diverse impulses, pressures and gravitational stresses.

"We are released from the protection of the womb as into a mold—the conjunctions that obtain at that time are the 'set' which is our perfect balance point. But, as cosmic movement never ceases, this balance is soon upset, never to be regained, always to be tipped and to know conflict in alignment from then on."

"I see. The influence of the stars and planets." Tuic was dispassionate, but privately he began to have his doubts. The Defense Ministry fooling with an electronic soothsayer? On the other hand it was an ancient pastime, and one sometimes still respected round and about. "You're a high-class astrologer."

"Astronomer, sir," Johan corrected, "and a student of climatology, geoelectrics, and magnetohydrodynamics. Everything, that is, that has relevance to the harmonics of radiant sources, so to affect bio-barometric correlates. There is a pattern and everything has its place. A person born to a never-to-be-repeated set pattern is subsequently endlessly at variance with the fluctuating patterns presented by the solar system and beyond. A person must constantly adjust to within fine limits in the only way possible to maintain equilibrium with the forces applying at any given time."

"And you can predict these forces?"

"By extension, yes. Backwards or forwards. In over five-hundred tests using historical figures of known accomplishment, I have verified the accuracy of my charting to ninety-seven percent. And much of the three percent error, I am sure, has been due to faulty and careless initial recording on the part of registrars, notaries, doctors and suchlike."

Tuic was not unimpressed. "Very interesting. Could you give me a demonstration?"

"By all means." To such an intelligent man Johan was willing to grant all things. "It takes but a few moments. If you will give me the

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place of your birth, and the date, to the hour and preferably to the minute, I can obtain for you a points graph of your life to the present moment."

He waited while Tuic hesitated. Tuic decided that the test would be valueless without the truth for a starter. "I was born in Gdansk," he said, "shortly before midnight. Another ten minutes, my father told me, and I would have had a different birthday . . ."

Johan stood Tuic in a sensing cabinet, and sealed him in for a second or two to glean the tiny flickers of his present emanations. This done, he seemed to have all the data he required.

Johan coded the information into the machine.

A short pause. Then the machine rapidly spun out a long print-out on a strip of paper as wide as a visiting card.

"My goodness!" Johan picked up the strip to drape through his fingers. "Quite a large number of peaks, Mr. Tuic. You must lead a very exciting life."

Tuic came to look at the short zigzag sections that had been scribed onto the paper. "Yes." He was guarded. "What does it mean? You can read that?"

"No, not me, not quite. These are sections of notable instances. The numbers and figures running, you see, indicate the day of the month and year, working back to when you were born. These black crosses that appear—as here, and here—are pluses to mark particular highs. And the red zero, like here, signifies a specially low period in your life."

"I see. Can you give the precise date? And can you give me some idea of what you think might have happened to me at that time?"

"Of course. Normally I have little difficulty selecting the five or six major high points for interpretation, but here I think you had better choose which years, and which experience you would like to be reminded of."

"Any one?"

"Any one you like. How about from your childhood, somewhere around here, say?"

"All right." Tuic pointed to a red zero. "Tell me about that one."

"Fifteen-five. May." Johan pressed buttons. "Fifteenth of May. You'd be eleven years old then." The machine hummed.

"What happens now?"

"That section of your graph is being duplicated, enlarged, and refined where need be. Although these squiggles may look all alike to you, each is different and precisely unique to the event that it represents. However, similar events tend to have a mean similarity one to another that makes them distinctive."

Cshunka, cshunka, chok! "Thus by running a comparison test with graphs of known causes, we can,"

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and Johan tore off the issued slip, "state that you broke a limb, almost certainly a leg, in a fall, very probably from a tree, midafternoon, that is around three p.m."

"That's amazing!" Tuic gaped.

"Those are the broad, bald facts," Johan said, not bothering to ask confirmation. "By narrowing the time period I could give you greater exactitude, and by subjecting the subsidiary descending peaks on either side to similar close scrutiny, the facts and simple deduction would tell me how the event came to pass, and how quickly you made recovery afterwards. But this can be a tedious process, and it's not really wanted in this case, is it? Would you like to make another selection?"

In wary wonder Tuic pointed to a plus peak.

"Twenty-eight-eleven. Good." Johan hummed with his machine as he triggered the pertinent instructions.

Fifteen years old—that glorious battle on the ice, when he and Kaplek had stood together and hammered a whole ragtag mob of kids, an intoxicating invincibility. It *was* a special day, a day that had had an elusive magic about it that had made it more exhilarating than ordinary. Seventeen years old—riding a spirited horse for the first time, the discovery, the fear, the rigid staring-eyed clinging as it had bolted, the wildness. Eighteen years old—the first time he had ever killed a man . . .

"It was an accident," Tuic said.

Johan read the slip.

"It was an accident," Tuic repeated. "I was on guard duty. The gun went off on its own." Had he been only eighteen then? "Anyway it was his own fault. The old fool shouldn't have started running."

Johan crumpled the slip. The graph had held a plus symbol.

Tuic's eyes narrowed. Now he knew this man to be dangerous. Now he thought of things that had never occurred to Johan. Such things like blackmail. Things like omnipotence in interrogating prisoners, things like outguessing his opponents, his rivals, his superiors. A whip hand.

Tuic reached and took the length of graph records. His hands slowly crunched it into a ball. "Tell me," he queried acutely, "you can similarly find out what is going to happen in the future?"

"Yes. A graph is produced much the same. Or if there is any particular day that you would like to know about in advance, always in reference to yourself of course, this I could obtain almost directly."

"Really?" Tuic smiled. "Then let us say a week from now. I would like to know what state I shall be in. Could you do that for me?"

Johan was looking at him with new eyes. "Yes." He sighed. "Very well." Johan's fingers keyed the need.

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In a few seconds a slip appeared. Johan ripped it off. Johan read. "Oh dear," he said. "Oh dear."

Tuic's chin lifted. "What is it? What does it say?"

Johan shook his head over the paper. "Oh dear."

Tuic took a step to snatch the slip from his hand. He stared at it. The slip carried a neat row of small dashes—nothing else. He frowned. "Well?" His eyes met Johan's. "What does it say? What does it mean?"

Johan looked discomfited. "It . . . means that you . . . won't make it to next Monday."

"What?" Tuic blinked. He looked down again at the row of dashes. "Won't make it? What . . .?" He paled. His head jerked up. "You mean . . . I'm going to die next Monday?"

Johan coughed. He did not like this aspect of his prescience. "Ah, death is . . . a high peak. For Monday," he was apologetic, "you have nothing. By Monday," he averted his eyes, "you will already be dead."

Tuic held the slip. The thought was stunning. He couldn't seem to get ahold of it. "That's ridiculous. There must be some mistake." He glanced again at the row of dashes—to mash the slip and fling it aside. "Obviously a mistake. I'm fit. I'm in perfect condition. I had a checkup only a few weeks ago. Perfect. A-1, the doctor said." He glared at Johan. "A-1!"

"Yes," Johan nodded gently, "yes, of course. Probably a mistake." But he could not conceal his measure of compassion.

Tuic's eyes were wide and he breathed hard. "It must be wrong." He searched Johan's face for hint of jest, duplicity, doubt—and was chilled by what he read. "It's a mistake, it must be! Run it through again! Try it again—and get it right this time!"

Johan moved to comply. Tuic stepped tensely closer. "Make it Saturday," he said. "Try Saturday. It's a better day . . . will be better."

"Yes," Johan said, not unkindly, forbearing to ask *which* Saturday. He made the request for the machine's summation.

Tuic hovered. When the answer came he snatched the slip before Johan could begin to reach for it.

Tuic read the small scrap of paper. His hands began to shake. The paper held only a row of dashes. "It's a lie," Tuic said. "It's a lie!" He swallowed. He panted, "It can't be true. The machine's wrong. The machine's wrong, do you hear?"

Broken leg—correct. Runaway horse—correct. The killing—correct . . . "It's wrong! It's not forecasting properly! I'm not going to die. How can I die? I'm strong, healthy . . . It must be wrong!"

Johan passed a tongue over his lips. "Would . . . Would you like me to try Friday?"

"What?" Tuic was trembling.

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"No!" He spun about to take restless questing paces. "It's foolishness. Sheer foolishness! I don't believe it, do you hear?" He jeered. "It's only a machine." He raised his fist and shouted, "It's senseless, absolute nonsense!" And then he laughed, loudly, "Ha-Ha-Ha! A fortune-telling machine! You fool!"

Sweat made Tuic's face shiny. "I'll show you, you idiot!" And he whirled, strode to the door, almost running.

Johan heard his front door slam. He was saddened. In morbid curiosity he turned to press buttons.

Then to his ears, scarce filtered by the walls, came the sound of squealing tires—and, at a different pitch, the thinner, despairing squeal of a human.

For a moment Johan gazed unseeing. *Cshunka, cshunka, chok.*

Johan bent unhurriedly to retrieve the answer. He read. He looked at his watch. Tuic had been right. The machine was wrong. By six minutes.

"He walked straight out in front of us. My driver never had a chance," Sir George Poncefoot said.

"He was in a disturbed frame of mind." Johan watched the ambulance pull out and away. He was still rather shocked. "Upset, you know."

"He must have been." Sir George huffed. He was somewhat vexed by the delay. "Extremely careless. Had he just lost a lot of money?"

"Hm-m-m? Oh, no. No, he'd just learned that he did not have very long to live."

"Is that so? Well, he certainly hurried it along. Are you a doctor?" Sir George was only casually inquisitive—it was something to do while the police finished questioning his driver.

"No, it was nothing like that. It had to happen—it was predicted, you see. Had he waited for a few minutes, perhaps . . . It's very hard to tell. And at such short notice . . ."

"Predicted? You mean that he believed in some mumbo jumbo palm-reading sort of rubbish, and lost his head when he thought the curse was on him?"

Johan straightened his back. "There was no mumbo jumbo concerned in the notification that his demise was impending. No witchcraft, sir, and no voodoo. The advice was derived from the purely scientific application of purely scientific principles to plain unquestionable facts."

"Really?" Sir George condescended to display the merest flicker of interest. "So you're a modern-style necromancer, are you? Bringing all the latest techniques to your aid. And how do you score, eh? How reliable has your guesswork been to date?"

Piqued, Johan said, "I never resort to guesswork. The results I ob-

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tain are honest, plain and unequivocal. To prevaricate would be self-defeating and pointless. My forecasts are one hundred percent reliable."

Sir George gave him a sharper look. "The devil you say! Can you prove that?"

"Of course," Johan said stiffly. "At any time you wish."

And that is how he came to have his association with Sir George Poncefoot.

"I should have thought it would have been easy," Sir George complained. And to his valet, "Gimmidge, can't you stand still, man?"

"Sorry, sir."

"Horses are not people," Johan explained somewhat tetchily. "Apart from the fact that we couldn't get a horse into the chamber for a present-check, the emotions of horses are a completely unknown factor. We have not one table for comparison. For all we know a horse might be delighted to come last."

"There must be something," Sir George grumped. "What's the good of looking into the future if you can't tell which horse is which?"

"My research has been in no way concerned with horses," Johan answered. "It is an entirely new field that would take years to correlate. For a start they all have the same official birthday, haven't they? Getting the precise time of foaling might not be simple. They

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will have a whole new range of peaks beyond interpretation."

"There must be some way," Sir George persisted. "The way you told me about things that have happened in my life was uncanny. Some of 'em I'd forgotten myself."

"Perhaps if we look ahead . . . ?" Johan suggested.

"Yes." And then, "No," Sir George corrected, remembering what had happened to Tuic. "No, your machine is a little too clever altogether." Sir George became pensive. He rather thought that a guinea pig was called for "Gimmidge!"

"Yes, sir?"

"Tell Mr. Schmidt when and where you were born . . ."

Privately Gimmidge thought that Sir George was taking a marked liberty with the rights he was permitted as employer. However, he was hopeful of a good reference when he left Sir George, so he suffered himself to a personal divination.

The experience was, in his opinion, not unlike a session with Madame Gayza and her Tarot cards. The difference was in detail and accuracy—at least with the random test dates taken from his earlier life. It was weird. He could not conceive how such diverse events could, without the least solicitation, become known just like that to a complete stranger.

Then, switching to the future, Gimmidge learned that he was going to come into a considerable sum of money, was going to marry, was going to emigrate to New Zealand, was going to start a modest business—possibly a nursery—and was going to live to the fine sage age of ninety-three. All of which *did* sound rather like the standard patter commonly to be obtained by crossing a palm with silver. Although such readings did not usually go so far as to state the day that the ship would sail . . .

"There, Gimmidge, what was wrong with that, eh?" Sir George asked. "Ninety-three. There's something you can look forward to. Nothing to worry about till you're ninety-two." There was just a faint touch of envy in Sir George's tone. "Nothing to worry about. It's a very reliable forecast, Gimmidge."

"So I've been given to understand, sir."

Sir George was a little irritated that his problem still somehow remained unsolved.

"Sir George, would you like a similar preview now?" Johan inquired.

"Uh? No." Then he changed his mind. "Yes. Not too far ahead," he warned. "I don't want my tongue hanging out for ages for a prize promised twenty years from now. No, just give me a short-range forecast." His eye gleamed as he hit the track. "Concentrate on this Saturday afternoon, from midday to five, at half-hour intervals."

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Johan was puzzled, but he did as Sir George desired.

"It can't be right," Sir George declared. "All afternoon and not one high point? I do not find *that* very credible."

"I'm sorry," Johan said, "but that's the reading—an unalleviated string of low marks." He was regretful. "You must receive some bad news this day."

"Oh, yes?" Sir George snorted. "Well I refuse to believe that it will be as bad as all that. I'll have *you* know that I have information that you know nothing about. There's a mistake there somewhere, Mr. Schmidt. You simply *can't* be right. I'm never *that* unlucky."

Johan thought it wiser not to argue.

"Yes indeed. We shall see, Mr. Schmidt. Gimmidge! my hat and coat. Yes, we shall see. It will be a good test of your system, Mr. Schmidt." For some reason he seemed offended.

Sir George shrugged into his coat, clapped his hat to his head. "We shall see," he said again. "Good *day*, Mr. Schmidt."

Sir George's own two horses ran second and seventh in their respective races. And, despite hot tips from seemingly authoritative sources, Sir George was unable to back a winner all afternoon. It made him quite cross.

But it did give him a renewed respect for Mr. Johan Sebastian Schmidt's auguries.

"That is correct," Sir George said. "In the two-forty, Gimmidge *did* back the winner. He took more notice of your advice than I did, eh, Gimmidge?"

Gimmidge coughed deferentially. "I just liked the name of it, sir."

"Ah. And the fact that *I* didn't back it. But," and Sir George rubbed his hands, "Mr. Schmidt here was able to detect the moment of your good fortune. Therefore," and he paused significantly, "the way should be open to make a killing."

"I don't think I quite follow you," Johan said.

"I've thought of a way." Sir George looked pleased with himself. "These last few days I have been giving the matter considerable thought—which resulted in my call to you to check Gimmidge. The answer is simple."

"Yes?" Johan looked around at the number of fresh faces Sir George had brought in with him. "What is it you have in mind?"

"These people are members of my staff and their friends. They have agreed to have their forecasts made for next Saturday afternoon. Now the way I see it is this—if all ten of them each place a wager on a different horse, then the one who backs a winner will show up in the readings, right? So, it's elementary, dear Watson—if I wager upon the same horse as he does in the same

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race, I shall unavoidably be on the winner."

"Hm-m-m. It sounds feasible," Johan said cautiously.

"It *is* feasible," Sir George pronounced. "It's an absolute certainty. We shall *all* benefit. Let's not waste time." Peremptorily he called his gardener forward. "Milton, give Mr. Schmidt your pertinent details . . ."

"I don't understand it," Sir George said. "It seems odd. Ten of them, and none of them back a winner in the first two races." He shook his head. "And then, in the third race, they *all* back the winner. That *is* the interpretation, isn't it?"

"Very strongly, yes," Johan said.

"But they're all supposed to have different horses!"

Johan fiddled with his lapel. "It's a rather complex reciprocation," he said. "Doing this, we were bound to find which person had the winning horse. Thus it would be silly for the rest to bet on horses known to be going to lose. So all would back the same horse—as the readout says that they will."

Sir George pondered for a moment blankly. "Ah." He thumbed his chin. "Yes, it makes sense, I suppose. All on the same horse?"

"That is the only conclusion to be drawn."

"Yes. Yes, I suppose it is."

"Theoretically there should be no possible chance of you making a mistake."

"No." But Sir George was still a little bothered. "And after the third they back no more winners? For the rest of the card they show no color at all?"

"They don't appear to. The third race is apparently the main event of the day, and it seems to suffice."

"Yes, that's true. Yes, it's the Cogland's Plate. I'd like to win that myself. Mercury Ball stands a fair chance, a very fair chance. The run Saturday did him a lot of good. He's coming to top condition. And he will be carrying four pounds less. Yes, a very fair chance." His look became very distant.

Johan had his misgivings—but who was he to interfere with fate.

Saturday. Johan was there. In a sheltered corner in the paddock there was a final briefing. The ten hired assistants listened gravely as Sir George Poncefoot again charged them with their duties. The fielders were due for a rough time in this important third.

"Now keep your wits about you. I don't want any mistakes. You've synchronized your watches, and I want you all to move in together right on the second. You should get eights at least. Remember, you're all on five percent. Anyone fouls up won't get a cent. But," and Sir George looked to the staid Johan, "there will be no foul ups, will there?"

Johan was uneasy. He didn't

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know what to say. He didn't know much about horse racing. He had faith in his forecasts, but there was one thing that didn't fit. And he couldn't see why.

"They've all *got* to back the winner, haven't they?"

"Yes," Johan said. "There is no other explanation for the clear patterns that stem from winning a gamble."

"Good. Well let's get to it—the books will be opening any minute now. Look lively, then, get yourselves spread."

"Yes, sir," they said. "At once, sir . . ."

Sir George was jubilant, in very high spirits. To Johan this explained something, yet baffled him more than ever.

They stood in the members' grandstand. "I actually got ten-to-one about Mercury Ball down there," Sir George said. "Ten-to-one! And not less than eights anywhere. They don't seem to suspect a thing. Of course, Lockhead and Kelly's Lad are pulling the big money. You know, I wish now that I'd got even more to outlay. I could have sold some of my reserve holdings. Still, never mind—we mustn't be greedy, eh? And there's always the next time, isn't there?"

They were informed that the horses were under the starter's orders. Sie George raised his binoculars to his eyes. The venue was unfamiliar to Johan and he did not know where to look, or what to expect.

"They're off!"

Johan peered. He could make nothing of the tiny figures bobbing along behind the back fence. The commentary blatting from the loudspeakers he found confusing.

Soon there was a rising in tension, the galloping horses approaching the home turn. A stirring on the course and in the stands, a lifting to the swell of sound. Into the straight. People on their toes, now, necks stretching, hands gripping, some starting to bounce, all making a noise of some sort. The loudspeakers were drowned out.

Johan saw the horses, jockeys flailing, color, pounding to the post. He found that he was shouting, too, but which was which he hadn't the faintest idea.

All over. The surge died, to a babble of voices in the quick talk of immediate surprised postmortem.

"Sir George?"

Sir George wore a glazed look. There was fixity in the way he held his binoculars just clear of his jaw. Johan's heart sank. "Sir George? It . . . It did win, didn't it?"

A very small cheer, and a ripple of commentary resumed at force as the number of the winner was posted.

Sir George shuddered. His face turned to Johan very slowly, as if his neck had suddenly gone rusty.

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He gazed dazed. Then his eyes shrank from wide-angle to pinpoint focus.

Johan ventured a tentative smile. "It . . . did win, didn't it?"

Color suffused Sir George's cheeks. "You imbecile!" he hissed. "You smart-alecky confidence trickster! You smooth-talking fancy-imagining imposter! You fraud! You swindler!" He breathed irate fire. "You won't get away with this! I'll sue you, so help me!"

Johan gulped. "It . . . didn't win then?"

Sir George stamped his foot. "No, you bloody buffoon, of course it didn't win! It didn't even come second!" He rammed his binoculars back into their case. "It came fifth," he snarled, "so there wouldn't be any chance, if I registered a protest, for interference." He angrily slipped the leather fasteners.

Johan did not have to be a machine to detect Sir George's quivering radiations.

"I was all ready to step down into the winner's enclosure. Look at me!" Sir George tore the carnation from his buttonhole and threw it to to the ground. "What a fool I've been!"

Johan was red also, from a different emotion. "There has to be a reason for the discrepancy," he said, "something that's been overlooked. I'm sure if . . ."

"You charlatan!" Sir George spat. "Why I ought to . . ." His fingers wriggled as he strove to contain himself. "You've pauperized me, you quack. And," he choked, "to be beaten by that scrawny bag of bones Key Donald. Key Donald!" Tears started in his eyes. "That horse only runs to advertise pet food. It . . . It couldn't win. It . . . just couldn't win." And overcome, he turned away, a shattered and bitterly disillusioned man.

Not wishing to get lost in such strange surroundings, Johan followed at a discreet distance. He felt guilty. He witnessed the rendezvous with the ten assorted retainers. He saw, as a performed ritual, the soleumn tearing into little pieces of losing betting tickets. So well timed that it might have been rehearsed, the fragments were thrown out by ten pairs of hands in unanimous gesture, a brief shower of confetti to flutter to the turf.

Sir George swore, swore at them for their efficiency, swore at them for not giving him the least cautionary counsel, damned their hides and cursed their names. Temporary or permanent, he fired them all on the spot, declaring that he could no longer afford the extravagance of their services.

On the whole, his servants took their dismissal very well.

"Gimmidge!" It was a roar.

Johan pricked up his ears.

"Gimmidge, you scoundrel!"

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Johan had taken a quiet drink, and then had decided to go home. There had been nothing he could do. Even now his hand was on the door of a taxi. He looked over his shoulder.

A figure, swerving, not running, but moving briskly. He saw Johan at the taxi, hesitated, quickly stepped over. "May I join you, sir?" He took command of the cab door. "Central Station," he ordered. "Let's get in, shall we? I mustn't miss my connection."

"Gimmidge! Stop!" And the body of Sir George burst into view, one hand outflung to halt. "Stop, you thief!"

The cabdriver screwed his head about in query.

"Get in, get . . ." Then Gimmidge saw that he couldn't make it. "Oh, never mind." He turned away from the cab to face the onset of his most recent employer. "Sir? Is there something you wanted?"

"Something . . . ?" Sir George puffed to a glowering standstill. "You conniving bounder! What do you mean by it, hey? What do you mean by it?"

Gimmidge smoothed his jacket. "Pardon, sir? What do I mean by what, sir?"

"Don't be cheeky! You know what I mean! You and the rest! Where're my winnings?"

"*Your* winnings, sir?"

"Yes, *my* winnings, dammit!" Sir George shouted, beside himself. "Don't play the wide-eyed innocent with me! Someone has just made a killing in there—and I don't have to guess who!"

"Sir, really, this is my own private matter . . ."

"I spoke to Stubbs," Sir George grated. "He congratulated me. He thought that Milton placed the bet on my behalf. Which he did, of course. Which you *all* did, of course, and you're not going to worm out of it."

"Sir," Gimmidge appeared mildly perplexed, "I don't quite understand. What seems to be the trouble?"

"What seems . . . ? Gimmidge, I'm warning you! That was *my* money. You used *my* money! You put *my* money on that spavined nag, and consequently the winnings are *mine*!"

"Ah." Gimmidge smiled as though seeing light. "Key Donald, you mean? Yes, sir, as it happens I *did* place a small wager upon that animal. Its price was so tempting."

"Uh-huh? A small wager, is it? The five hundred dollars I gave you to put on Mercury Ball!"

Gimmidge tutted. "Most unfortunate for you, sir, that it lost. But that's the luck of the game, isn't it?"

"You . . . You . . ." Sir George spluttered, "You didn't back it!"

"Oh but we did, sir, on your behalf. You would have been paid in full if your horse had won."

"But it didn't win! You diso-

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beyed my orders! You put everything I gave you onto that knock-kneed outsider!"

"Sir—you lost," Gimmidge said flatly. "If we obeyed orders—then you lost. We were not instructed that we could not ourselves wager upon a horse that we thought stood a better chance. And we had a . . . very strong hunch, sir, almost mystical you might say, that our choice would be first. On form, sir, Mercury Ball looked quite good, sir, I grant you, but to me, to us, to the syndicate, sir, Key Donald was too outstanding a proposition to pass over. Purely a matter of preference, sir. You made your selection which, naturally, is your sovereign right. And we made ours, which you must allow we were perfectly entitled to do. A little flutter, sir, the exciting risk of a personal investment in the big race."

Sir George fumed impotently. "Liar!" He hardly knew what to do with himself. "Liar! You didn't back Mercury Ball at all!"

"No, sir—but *you* did." And Gimmidge coolly took this moment to step into the cab, adroitly. "Harkinvale," he told the driver. He shut the door. "And please hurry, there's a lady waiting."

"Right."

Sir George gibbered on the pavement. "Here! Now! Wait, you . . ." But the cab pulled away.

"The swine," Sir George said. "The dirty ungrateful swine. After all I've done for them. Five percent wasn't good enough for them, oh no. They must have cleaned up a fortune. The swine, the rotten swine."

Johan could think of no words of comfort at all. He drove Sir George's limousine and prayed to get to that man's home quickly that he might then effect his escape.

"The nerve of the scum. Do you know what they've cost me? Do you know? By not doing what they were told? Nearly a hundred thousand dollars they've cost me. A hundred thousand!"

Johan concentrated on his driving, longing for a drink.

"And they walk away with close on half a million—won with my money!" Sir George could find no place to look, closed his eyes only to trap frustration in blackness. "Gah!" He pummeled his seat in temper. "Schmidt! They can't do this to me!"

Johan drove. He felt sticky, embarrassed, as though somehow it was all his fault.

Sir George held his head in his hands and, except for heavy breathing, went silent for a while. Then, harshly, "Schmidt, did you know this was going to happen?"

Johan had dreaded this question. "Uh," he made much show of taking a left turn, "well, uh, Sir George, there . . . was an anomaly that I could not account for. The recording of such . . . exact configuration is, as I've said, always

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unique. I was misled . . . by the other . . ."

"You checked up on *me*?" Sir George accused, stiffening in his seat. "You checked up on mine without my knowledge!"

Johan squirmed. "Well, once we have the qualifying details . . . the rest, uh, is on request, so to speak. As a matter of interest . . ."

"You unsavory hound!" Sir George became pop-eyed. "Who gave *you* permission to pry into my future? Of all the gall! I told you expressly that I had no wish to know so far ahead. You snooper! You keep your nose out of my future, do you hear?"

"Of course, Sir George, I was only . . ."

"Stop the car! Stop the car!" Sir George demanded. "Stop!"

Johan hastily braked and pulled to the side.

"Stop! I'm not having *you* driving *me*. Out!"

Bemusedly Johan opened his door and got out.

Sir George humped his bulk over behind the wheel, reached for the door, slammed it shut. "I should think so." The window framed his face. "You destroy what you have on me, do you hear? You try anything, you find out anything, if you . . . you . . . You just try, that's all. I'll have the law on you so quick your head'll spin. Mind your own business, understand?"

He stepped on the gas and went skidding and screeching away, spattering Johan with mud and small stones.

Johan Sebastian Schmidt took time out for long and sober cogitation. His astute labor to place the art of clairvoyance upon a sound scientific basis had not quite turned out as he had anticipated that it might. In review he was aware that he had underestimated the difficulty of overcoming the credibility gap. But yet, when this difficulty was overcome, the problem then became the matter of inevitability.

He had been helpless to save the day for Sir George. Even the foreknowledge of the knowledge of foreknowledge seemed to have its place in the auspice. And once known, there was nothing that could be done about it. Of course, when it was *un*known there was nothing that could be done about it, either—but not knowing that, the effort could be made in trying anyway, with ignorance being no bar to the happiness achieved by a measure of thought success.

Absolutely knowing positively beforehand tended to encourage irreversible fatalism that implicitly sapped the will to attempt alternatives. Made aware of what the future held, it remained only to endure, to wait for such things to come to pass.

The man in the Ministry of Defense had not been conscious how right he was. And Sir George—he

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had shied from a personal delineation of a destiny that would brook no variation, that would eliminate his hope for better, that would reveal to him the unavoidable worst.

Johan had to admit the truth. He had never made a forecast of his own future. His excuse had been the conceit in his own confidence. His excuse had been that he wanted to remain objective, and not become subjective. His excuse had been that he did not know at what time of day he had been born, and he had mislaid his birth certificate.

Now he thought about it. The truth was that he did not *want* to know precisely what the future had in store for him. He might have learned that he was to be a failure. He might also have learned that his next step was to walk outside and hang himself. Now he admitted to himself—he had been afraid to see such things. And he had been afraid to see mediocrity endlessly stretching. He had been afraid, period.

The diagnostic web that he had added together feature by logical feature had proved to be just a little *too* good. To deny laxity and boredom, it became apparent to Johan that a large degree of the inscrutable had to be retained by the immutable. He wondered how much robbed excitement Gimmidge would know in the adventure of taking ship, just how much edge might be taken from his zest in his following of his comprehensively-listed predetermined course.

At the end of a few days deep introspection and brooding, in sincere and honest-as-maybe self-examination, Johan concluded that he would be wise to desist in the promotion of his own over-reliable

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October 12, 1492 SAN SALVADOR (Indian Press Agency) *Reports of large UFOs—Unidentified Floating Objects—persist on this island, despite reassurances by the local chiefs that they are merely cases of mistaken identification of normal phenomena, such as light reflections, or evil spirits. According to eyewitnesses, one UFO was shaped like: "A large canoe with blanket-covered trees growing in it . . ."*

Some reports state that there were three such objects, all moving in a loose formation, and at least one person here claims to have been contacted by the inhabitants of the objects, whom, he states, are tall, pale-skinned and strangely-clad Indianoids who communicate with each other in some incomprehensible tongue. Many, it is reported, carry unusual devices in their hands which may be weapons . . .

The authorities repeat that there is absolutely no danger of any "invasion from the sea," and that all of the reported "sightings" will be fully investigated by a board of medicine men. STEPHEN LEWIS

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oracle. He sensed, late, something of the danger that Tuic had seen. Johan even began to feel thankful that his discovery had not, after all, been immediately and avidly taken up in the marketplace, to be trumpeted far and wide, beyond shushing and redemption.

Johan made his decision. But a problem remained. He was a specialist, the only one in his class, and he was not as young as he was. Years of scrimping patience had gone into his accumulating assemblings—what now? His machine was too specifically, minutely attuned to one goal to be readily switched to attend another. And after so long, no, he couldn't, just couldn't, see it all wiped clean. Dammit, he simply couldn't wipe his own mind clean—*he* was attuned also.

The sign read: "Scientific Prognostications, Inc."

"He's dear, but he's ever so good, Ethel, he really is."

Ethel giggled, and thus persuaded, entered Johan Sebastian Schmidt's domain to submit herself for a reading.

And Professor Schmidt obliged. Austerely he tucked her ten dollars into a pocket of his magnificent purple robe, one with golden signs of the zodiac scintillating from his hood to his hem. And after sparks had flown and lights had flashed, and the tang of weird green smoke had permeated the air, then in sepulchral tones Johan read to her her prospects for the future.

With the dim lighting, the cunning glow at his feet, it was all very impressive and good value for money. "In three weeks time, on a Friday evening, you are going to meet a dark and handsome stranger." (How dark and how handsome he could not say; possibly short, fat and ugly, but the finer details were not important.) "He will sweep you off your feet. You will have two children." (There was no graph that compared with a wedding procedure, so Johan skipped it.) "You will know some sorrow." (Didn't everybody? Johan saw no point in elaborating on this.) "But much happiness in your romance for the rest of this year." (Ho-hum, and she'd be sorry, but why spoil it? He could do nothing about it anyway.) "And five years from now, in the summer, you will again know a long period of great enjoyment." (By the looks of it another fellow; but no wedding with him, either.) "You will live to a ripe old age." (Fifty-five was fairly ripe; it would be sudden, a plane crash from the indications.) "And you will have at least two grandchildren . . ."

It was, Johan found, quite a good living. He was starting to get one or two socialites. Soon he would be able to put up his rates and burn real candles . . . ■

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P. Schuyler Miller

THE BEST SF SHORT STORIES

After each of our "Best Science Fiction" polls I have had quite a few letters from readers demanding that I take a similar vote among Analog readers on the best science fiction short stories. Until the recent spate of paperback originals, science fiction has been primarily a medium for the short story and novelette writer. H. G. Wells set the pattern, and practically every writer of note has followed suit.

I have ducked the "opportunity" for a short story poll for some very good reasons. First is the tremendous amount of work involved in tallying the votes on what are bound to be hundreds of individual stories. This department is strictly a spare time operation, and my full-time job often doesn't leave me any spare time for weeks on end. Second was the fear that the votes would be so scattered over so many stories that there would be no clear choice to report.

I am still not going to stick my neck out, but somebody else is going to do it for us. The short story poll starts when you read this issue of Analog.

Michael T. Shoemaker, a member of the Washington Science Fiction Association, has volunteered to take on the job. The *WSFA Journal* has an enviable reputation as a free-swinging fanzine that tackles many tough bibliographical and critical tasks head on, and it is easy to see why. We've agreed on the ground to be covered, and this is the starting gun.

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First, we are asking for two lists. If you read mainly the anthologies, you probably know the older stories best. If you read magazines, you know the new writers. We are giving you the opportunity to vote for a list of "oldies"—anything published before 1940—and also for a list of "all-time best" stories. The Science Fiction Writers of America's "Science Fiction Hall of Fame" has only three stories published before 1940, which I don't think is a fair picture of the field, and I twisted Mike's arm. Send in one list or both, as you like, but mark them carefully. If you're not sure a story is an "oldie but goodie," guess; it will come out in the statistics.

Second, we are suggesting that you vote for fifty stories in each list. We don't expect to come up with a final choice of "fifty best" but this is a statistical precaution, based on past experience with the Analog polls and at least one "Hugo" ballot. If voters send in lists of fifty preferences, enough will agree on the best to make selection reasonably easy. Mike Shoemaker will be free to cut off the tally at any point that seems reasonable, to get a final selection of twenty-five or thirty winners.

Third, you are voting on short science fiction, but not only on short stories. Basically, we want you to vote on stories that are not long enough to be published separately as a "novel," but that includes a good many novelettes and what are now called novellas. Mike is setting 40,000 words as the upper limit: stories like Heinlein's "Gulf," Van Vogt's "Recruiting Station," or Zelazny's "He Who Shapes" though that was expanded into a novel and would be ineligible.

Fourth, this is a science fiction poll. No fantasy—not even from *Unknown Worlds*. The voting will eliminate anything that doesn't belong, but if you vote for a fantasy you are just throwing away your vote.

Fifth, you are voting for *stories*—not books. However, you can list a complete series of closely related short stories and novelettes as one choice, and have forty-nine more to go. This is going to be one of Mike's toughest decisions when he gets into the tallying, but generally speaking you could give one vote for the "Gallagher" stories, or Zenna Henderson's series about "The People," but you must list specific titles in Heinlein's "Future History" series or (regretfully) "Cordwainer Smith's" series, which cover all space and time in their scope.

Sixth, the cut-off date is two months after publication of this issue of Analog. The first and only announcement is in this issue, on the stands in December, you must have your ballot in the mail by the end of January. That gives subscribers a break; you West Coast

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people get Analog a good two weeks before we do in the East, but no matter.

Finally, send your lists to:
Michael T. Shoemaker
3240 Gunston Road
Alexandria, Virginia 22302

Not to me. Not to Analog. Not to anyone but Mike Shoemaker. He will announce the results first in the *WSFA Journal*, since he and his friends in the Washington group will be doing all the work, and because it is unreasonable to ask him to sit on the results while Analog goes to the printer and works its way back to you. I'll report to you just as soon as I can, though—which probably means early summer.

So start thinking. Check your memory. Check the anthologies. Talk to your friends. Take a club poll of your own, if you want, and send Mike Shoemaker the result. Several SF clubs did that before. But vote.

THE SIMULTANEOUS MAN
By Ralph Blum • Little, Brown & Co., Boston • 1970 • 238 pp. • $5.95

I have a feeling that NASA would not have bothered with a quarantine for the Apollo astronauts if Michael Crichton's "The Andromeda Strain" had not been published exactly when it was. That book presented the possibility of a lunar plague so convincingly that it would have been unthinkable not to take steps to prevent it from coming true. Since the author had a background in medical research, it was also completely realistic, down to a bibliography that mixed real books and papers with fake papers in future issues of actual scientific journals. Crichton turns out to be the "James Norman" who wrote the four Burroughs-type yarns in the "Gor" series, which I consider fantasy and haven't reported here. ("Andromeda Strain" is now a Dell paperback for $1.25, by the way.)

At any rate, we now have another even more frightening book by another author with "inside" information. Ralph Blum, we're told, is also a scientist who has studied in the U.S., Italy and Russia and was a guinea pig for experiments with LSD as a drug for treatment of mental disorders. He has contacts inside the Army's Chemical and Biological Warfare Laboratories—the ones that are supposedly not experimenting any more—and this book describes an experiment which might have been made there.

The technique is an extension of brainwashing. The personality of a "volunteer" from a federal penitentiary is completely erased, using drugs and psychological techniques that you can find in the literature. Once he has been made a *tabula rasa*, a complete new personality and individuality is poured into his empty mind, using ad-

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vanced audio-visual methods to generate recorded "memories."

Meanwhile, the scientist whose personality has been recorded and transferred to the "simultaneous" man who will be made into a synthetic replica of himself is being kept out of the way. The authorities don't want him meddling, don't want to hear his second thoughts about what they are doing, don't want anyone wondering about the manufacture of programmed geniuses from nobodies out of the jails.

And then "Black Bear," the Negro murderer who has been made into a synthetic scientist, escapes to Russia . . . and Horne goes after him—after himself in another body.

It may not get it, because fans may not read it before they vote on the best science-fiction novels of 1970, and because the SFWA Nebula awards tend to go to writers from within the guild, but "The Simultaneous Man" definitely rates an award.

ICE CROWN

By Andre Norton • Viking Press, New York • 1970 • 256 pp. • $4.75

This is one of the minor offerings in Andre Norton's impressive shelf of "juvenile" science fiction—which loses the stigma when the paperback editions come out. It may start a new series which will develop some of the themes and mysteries at which the author only hints now. However, the book's shortcoming is simply that it is a standard costume romance decked out with the trappings of science fiction—one of the author's own excellent historical yarns in future costume.

We learn a little more about the future universe in which all, or most, of Miss Norton's books are set. In the distant past were the Forerunners, the exceedingly powerful race or races which ruled the galaxy for aeons and disappeared before men spread out to the stars, leaving a few relics and many mysteries behind them. They are always present, or just off-stage, in Andre Norton's books.

Mankind did replace them on the starworlds, and a decadent elite known as the Psychocrats rose to the top. Among their experiments were what later men call the "closed" worlds—populations brainwashed, given false memories, programmed by totipotent computers, and dropped on strange planets to play out their "Guardians" fancies. Clio is such an experimental world, forgotten when the Psychocrats were overthrown some three hundred years before the story opens. It is a world where feudal Europe had been reconstructed, with royal lines selected and made powerful by the Psychocrats' "crowns."

Roane, the heroine, is the orphaned niece of a rather self-cen-

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tered archaeologist. She is taken to Clio as his assistant in a search for Forerunner treasure. Instead, she finds herself drawn into the palace intrigue of the kingdom of Reveny, whose young queen is hunting for her lost crown. Interference with native affairs is strictly forbidden, but Roane cannot help herself. They find a Psychocrat conditioning station—find the Ice Crown with the bones of the schemer who stole it—but that is where the trouble starts.

Because Andre Norton paints strange worlds so vividly and builds the mystery of the Forerunners so subtly, "Ice Crown" seems something of a let-down. Her "Janus" books are my favorites, I think, and her new "Zero Stone" series is far from finished. Perhaps Roane will uncover—and solve—more and deeper mysteries on Clio. Do some of the Psychocrats still survive—and rule behind the scenes on Clio and elsewhere? What Forerunner ruins and marvels are yet to be found? What will happen to Reveny with the Psychocrat conditioning lifted—if it is lifted? Even tepid Norton is pretty good.

TAU ZERO

By Poul Anderson • Doubleday & Co., Garden City, N.Y. • 1970 • 208 pp. • $4.95

Part of this book was serialized in *Galaxy* three years ago as "To Outlive Eternity." It is the only book I can think of offhand that deals with travel at speeds approaching that of light, in a "quantitative" way and as the basis for a legitimate story.

What makes low-tau space flight feasible as a substitute for the more familiar generation ship, as a means of reaching other stars and galaxies, is the *Leonora Christine*'s Bussard drive. This is based on the knowledge that interstellar space is awash with hydrogen, and that this can be swept up by the ship and used as fuel in a kind of ram-jet operation. The faster the ship moves, the more hydrogen it sucks in, and the faster it accelerates . . . until it approaches the velocity of light, the outside universe has become exceedingly strange, and aeons go by back on Earth for every moment of ship's time.

All very fine, and it is going to take a picked crew to find another home among the stars, but one little, unpredictable cosmic joke is played on them, and presently they are in a runaway ship that is spanning galaxies and intergalactic voids as if they were planetary distances. This is the "hard science" framework of the book. Played against it is the personal story of the members of the crew, not as convincing as in some of Poul Anderson's other books, but real enough.

I don't think the book will be very popular now, but I have an idea people will remember it and go back to it for a long time.

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THE TIME TRAP GAMBIT

By Larry Maddock • Ace Books, New York • No. O1043 • 255 pp. • 75¢

The is the fourth—and by far the best—of the "Agent of T.E.R.R.A." time-agent series. TERRA—let's skip the periods in the acronym—stands for Temporal Entropy Restructure and Repair Agency. As in other similar series by other authors—is "Larry Maddock" one of them in disguise?—it is dedicated to keeping the time threads untangled when others try to remake the past and future to their own advantage.

This time something is going wrong in northern Africa, where the war between Carthage and Rome is going wrong. The victors are becoming the vanquished—so Hannibal Fortune and his symbiotic buddy Webley are sent back to 203 B.C. to find out what is happening and see that it is fixed before the history of Planet Earth—Galactic Federation No. 38—runs wild. He does, he finds the familiar baddies on the scene trying to make Rome lose, and he is suckered into violating some of the basics of time travel, in particular the Rule of Doubletime—no man can exist twice at the same time.

The first three books in the series were lively fun in a more or less perfunctory way. This time, the author seems really to have become fascinated by the period, people and events of the Punic Wars and his enthusiasm spills over to his readers. Its one of the best time-travel adventures in a long time.

GENESIS FIVE

By Henry Wilson Allen • Pyramid Books, New York • No. T-2162 • 190 pp. • 75¢

Here is a beauty that I missed when Morrow published the original edition in 1968. It has no great scientific or social significance, but it is a rousingly good story, well told, with a hero you can believe in and a thoroughly black villain who comes to a thoroughly bad end.

The time, as you discover gradually, is the future, when the "Old Soviet" appears to have resolved its differences with Maoist China and joined with other nations—perhaps all nations—of Asia and Europe in a Supreme People's Union. A World Peace Organization has replaced the United Nations, about a quarter-century before, but there is still an America.

Yuri Suntar, the hero, is a Mongol-American hybrid and, like all Mongols, an individualist and maverick. He is summarily hauled off to the Siberian Center for Genetic Synthesis, on a synthetic island north of Siberia, to try to control his even more intractable brother, Yang the Wolfmaster. Here, in the depths of the planet, an heir of Dr. Fu Manchu is breeding the coming race by the techniques of mo-

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lecular biology and a few that have not yet been invented. It is Dr. Ho Wu Chen's plan to blend the most useful traits of men, wolves and bees in new creatures, the larvanoids, which will be as fierce as wolves, as socially programmed as bees, and as intelligent as men. They will conquer the Earth for the Supreme People's Union . . . then they will replace mankind for Dr. Ho.

Think of Yuri Suntar as a modest Russian James Bond and you won't be far wrong. It slowly becomes evident that he has a somewhat more definite mission than the first chapters suggest; evidently Moscow has its reservations about Dr. Ho and would like to regain control of whatever he is doing. There are beautiful women, there are stalwart heroes, there are lots of gadgets and monsters and bloodshed . . . in short, the book has everything. And it's well enough written to make you believe it all. At least, while you're reading it.

BEHOLD THE MAN

By Michael Moorcock • Avon Books, N.Y. • No. V-2333 • 160 pp. • 75¢

"And he spoke, saying unto them, 'Yea, verily, I was Karl Glogauer and now I am Jesus the Messiah, the Christ.' And it was so."

You may remember the lines from the novella which won a Nebula award a few years ago. Now—in fact, two years ago in England—the author and publisher of *New Worlds* has expanded his haunting story into a novel.

The cover blurb is quite wrong. Karl Glogauer is not at all a "nonbeliever." It is because he is a believer in the historical actuality of Christ, and in the events recounted in his disciples' gospels, that he finds himself trapped in the web of history and lives and dies on the cross as Christ. Because of his belief, he has allowed himself to be the guinea pig who goes back two thousand years in an experimental time machine to witness the Crucifixion and to see Jesus of Nazareth for himself. The machine is wrecked; he is rescued by a group of Essenes led by John the Baptist; he finds that the son of Joseph could never be the Messiah of history; and he allows himself to be drawn into the story he knows so well and had hoped to witness as a bystander.

This story was told, and told well, in the original novella. In making his story a novel, Michael Moorcock has used some of the "new wave" techniques of flashback and stream of consciousness to flesh in the portrait of Karl Glogauer, and show us how a tormented boy became the kind of man who would let himself be drawn to the cross on Golgotha. I feel he has diluted the portrait he had already sketched clearly enough, but it is a book that will be remembered.

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brass tacks

Dear Mr. Campbell:

Thank you for your editorial, "Cliff-Hanger," in the August Analog. As long as I live, I will never forget those terrible 80 hours of suspense while our three boys fought for their lives. To think that this harsh page straight from reality would only ten years ago have been thought of as fantasy . . .

At the time of the Apollo 13 flight, I was reading Bob Heinlein's "The Green Hills of Earth." The night of the blow-up I was reading "Ordeal In Space." The lines from that story that I am about to quote, I showed to friends and family. They usually brought tears to their eyes. And now, I think, how applicable are: ". . . We ask Thy Mercy and Thy Grace, For Those who venture into Space . . ."

WILLIAM MAX MILLER
801 Salt Street
Saltsburg, Pennsylvania 15681

There are a lot of science-fiction stories we'd rather NOT have come true!

Dear Mr. Campbell:

Regarding your editorial on the "red tide effect," I couldn't agree more that our problem is quantity, not necessarily quality, of pollutants. However, I'm afraid you've fallen for one of the same half-truths as Mr. Cronkite: Farm fertilizers as the main source of phosphates and nitrates contributing to eutrophication of our lakes and streams.

While farmers do apply a great deal of fertilizer—often in massive amounts—very little is washed from the soil. Phosphate fertilizers revert quickly to insoluble compounds via ionic exchanges that bind them to iron and aluminum compounds. Soil research over the years has shown that phosphate ions move very, very little in soil—they neither leach down into the soil, nor wash off the surface.

Nitrates, of course, are highly soluble and hence can be removed from the surface by water. However, most of this translocation is

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downward into the soil. And even this percolation is minimal on cropped land—plants utilize it before it passes beyond the root zone.

USDA's Agricultural Research Service conducted tests at Coshocton, Ohio, and Morris, Minnesota, to measure runoff pollution of nitrates and phosphorus from farmland. They found the loss of soluble phosphates to be from 0.03 to 0.06 pounds per acre per year—*whether from woodland which had never been fertilized, or from farmland getting normal amounts of fertilizer.* Nitrate runoff showed more variation, but ran around one half pound per acre per year from woodland; three pounds per acre per year from farmland. Not enough to do any harm, but certainly doing no good either.

Compare that with the urban contributions—*one sewage plant for Washington dumps 8 million pounds of phosphorus and 24 million pounds of nitrogen in the Potomac river each year.* And that's piped to the waterways.

Since there is apparently no "economical" way of removing nitrates and phosphates from sewage, it's up to nature to break them down—biodegradable detergents, remember. Which means algae and bacteria populations promptly proliferate in this food-rich environment.

Which is not to absolve agriculture. Fertilizer runoff is not a major contributor to pollution. ***But plain old soil erosion is.*** Whenever soil is carried into streams or lakes by heavy rains, nutrients attached to the soil particles will be carried along. But the soil particles themselves are the major pollutant in a good many streams and lakes. Clear, fast-running rivers silt in and turn into cesspools—shallow, muddy and slow moving. Lakes designed to last 100 years fill up in 25 years or less. One Iowa environmentalist flatly says that the biggest problem in that state is siltation.

This, if anything, distresses the farmer more than "conventional" pollution—even more than being blamed for nitrate and phosphate buildups in streams and lakes. It not only affects him esthetically, *it's his livelihood going down the drain.* And farmers spend hundreds of millions each year for measures to stop soil from washing away; USDA spends millions more to achieve the same end.

If we do reduce population by 80%, it can be done much more cheaply, of course. We just plant most of the country back to trees and grass, promptly solving the siltation problem (grass is a remarkable filter—it separates soil particle nitrates and phosphates from the water). The question is: Which 20% stay? And how do you convince the other 80% to cooperate?—

REX M. WILMORE
873 Yorktown Street
Lansdale, Pa.

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Sorry I goofed on that fertilizer business—Soil Chemistry was not on my curriculum!

As to which %—well, that's apt to be settled in the old-fashioned way, judging by the destructive violence students at universities are now demonstrating!

Dear Mr. Campbell:

Three and a half years ago, I married a science-fiction nut. By *nut*, I mean that he enjoys the stuff to the extent that, when he was a poor struggling student, he would go to the secondhand book store and buy all the issues of a given SF magazine for, say, the year 1935. When he became a filthy-rich engineer, he became a subscriber to first *Amazing* and then Analog. He's not a pushy fellow and rarely gives his opinions unless specifically asked, but he does leave his SF magazines lying around. He'd actually put off paying IEEE and NRA to insure his not missing an issue of Analog.

In the fullness of time, I exhausted his library and mine as far as conventional subjects are concerned. And filthy-rich engineers' wives don't always have the money to go out and buy one more paperback to fill the time between the house, the dog, the part-time job and/or school this week. So it was that only my need to put reasonably, imaginatively contrived words before my face that drove me to SF. For a long time, I thought that the only portions of interest to me were the stories. I knew there was science fact there, too. It plainly says so on the cover but I barely know an ohm from a neurotoxin, so why cross my eyes over that . . . Then, I discovered the editorials—it was another bad week for paperbacks.

Alas, where have I been all of your life . . . or vice versa?? What opinion group do you represent? Hey, here I am; count me in. How do I spread the word? Don't tell me I'm the silent majority; I'll spit in your eye! If you have an extra flag, send it along.

SALLIE ROBERTSON

The group is the "Maybe we'd better look at both sides of the picture before deciding" Party!

Dear Mr. Campbell:

It's almost amusing to hear pseudo-Liberal politicians in government and elsewhere describe themselves as the saviors of humanity and their enemies as Fascists. For years, in their political campaigns, they've denounced their opponents, such as Barry Goldwater, in 1964, and George Wallace, in 1968, as being protégés of Hitler. They've also accused anyone who disagreed with pseudo-Liberals about anything in the same terms. Somebody had better read his history books. Hitler and Mussolini, who were Fascists, established themselves in power by, among other things:

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(1) Registering, controlling the sale of, and, eventually, seizing all privately-owned firearms:

(2) Establishing a national police force; Hitler, you may recall, called his a Gestapo.

(3) Deciding who could have children and who could not (a population-control program) and sterilizing the unfit with der glorious Fuhrer deciding who was unfit.

So now, of all things, all three of the above programs are being pushed by the people who go out of their way to describe themselves as "Liberals:" Joseph Tydings, U. S. Senator from Maryland, is pushing gun controls in the Senate, while Milton Eisenhower, head of a Presidential commission, recommends the "eventual" confiscation of firearms, to be taken "from everyone except those who need them"—and you can guess who'll decide who needs them: "Liberal" Democrat Hubert Humphrey, presidential candidate in 1968, is, as I recall, on record in favor of a national police force; and "Liberal" Senator Gaylord Nelson, writing in the magazine *Progressive,* and Professor Paul Ehrlich, in a host of speeches, demand that government do something about ecology and the birth rate.

Isn't it nice to know It Can't Happen Here?

ROBERT A. MARTIN
1620 Bedford Lane
Norman, Oklahoma

"Oh, but you don't understand! We're good people and we don't mean it that way—it's entirely different when WE do it!"

Dear Mr. Campbell:

About your July editorial—Wouldn't it be better public relations if they called it "*Anti*-Biological Warfare?"

SARA PENN (MRS.)
839 36th
Richmond, California 94806

I agree—it would, and they should. But do you think the hysterical anti-government Liberals would let the news media "call it like it is"?

Dear Mr. Campbell:

Concerning your article on the dreadful germ warfare researches of the Army:

As a New York area citizen, you no doubt recall that smallpox scare of some years back? A puzzling disease killed a man who had been abroad and no one around NYC had ever seen the disease. Specimens sent to the Armed Forces Medical Labs proved it was smallpox. Thanks to vaccination, that old killer is rare here, and some fatuous folk urge the abolition of smallpox vaccination since there isn't any, and it must really be imagination . . .

JOHN P. CONLON
52 Columbia Street
Newark, Ohio 43055

One thing about the real biological warfare—there's neither truce,

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ceasefire line, nor peace treaty. Peace comes only with successful genocide!

Dear Sir:

It is rare that one gets to read an editorial as ill-conceived as the one on "Biological Warfare" in your July issue. We would all agree that it is important to develop methods of isolating and developing defenses against unknown harmful organisms, but to call that "Biological Warfare" is clearly a misuse of the term.

As far as I can determine, all "Biological Warfare" research carried out by our government is classified. It does not seem to me that any purpose could be served by keeping researches into the prevention of disease secret, but it seems logical to keep researches into ways of spreading diseases amongst your enemies secret. Therefore, I would conclude that all current "biological warfare" work in this country is offensive and not defensive in nature.

If you wish to arouse interest in the prevention of disease, that is commendable, but to call this prevention "Biological Warfare" confuses the issue and exposes weakness in your thinking.

STANLEY EZROL

Dover Publications, Inc.
180 Varick Street
New York, N.Y.

You are wrong, sir. Some *of the research is classified—but the major work on identification techniques, et cetera, is released. And if developing techniques to control invading biological enemies is not bacteriological warfare, then coastal defense installations should not be part of the U.S. military budget!*

Dear Mr. Campbell:

Your well-known pet peeve against Science for refusing to investigate what It knows *a priori* to be impossible would find a splendid target in the Sasquatch, alias Bigfoot. "On the Track of the Sasquatch," by John Green (Cheam Publishing Ltd., Box 99, Agassiz, B.C., 1968) gives an excellent account of the subject.

Unless Mr. Green is lying mightily, some unknown species of biped inhabits the western mountains in substantial numbers from California to British Columbia. Its footprints, thousands of which have been found, closely resemble those of humans, but range up to 20 inches in length and 8 inches in width. The depth of the impressions in sand or loose soil suggests that the maker must weigh 500 to 1,000 pounds.

Bears and hoaxes are, of course, the standard explanation of those who have not seen the tracks. The bear theory evaporates on sight: the prints are too big, the toes are all wrong and there are no claw marks. The hoax theory would have to explain how and why

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someone has made thousands of tracks varying widely in shape and size, scattered over half a million square miles of largely wilderness country and seventy years of time. Forget it!

From reported sightings, a full-grown Sasquatch is 8 to 10 feet tall, very heavily built and more manlike in form than any known ape. Without the tracks, such an animal fits nicely in the hallucination—tall story category. With the tracks—well, you explain it.

Is Science giving the cold shoulder to Man's closest and most impressive relative? With reasonable credit or veracity, Mr. Green's book answers with a clear "Yes". Moreover, the critter is right in our own back yard—no Himalayan Yeti-hunts necessary.

How about a blast, Mr. Campbell?

A. O. ROGERS
981 Escarpment Drive
Lewiston, N.Y. 14092

You just blasted—now I won't have to!

Dear Sir:

Having just completed the article "The Simple Way" in the June 1969 issue of Analog. I am fascinated by the development of the "ultimate" microphone. I would like to know more about this development since the article was written, as I am interested in obtaining or constructing, if possible, a set of these microphones of the future. In any case, further information would be appreciated greatly!

It may seem strange to have just completed a SF magazine a year after it was published, but I'm in Vietnam at the present, and I reads what I gets! I *am* a great fan of SF but, for as much as I read, I would have to be a millionaire to subscribe to all the magazines that feature the authors that I want to read. So, I read when I can, and what I can. My job as a "Chinook" pilot does not allow me to do so on the job and, if it did, I wouldn't anyhow. The job we're doing here is too important to warrant the smallest inattention.

Again, I would appreciate the information as I do need a pair of mikes for my stereo gear when I return to the States shortly. That is, if the *nuts* that are doing all the protesting leave any of the States there. Send 'em over here and let 'em protest to the NV or the VC.

FRANCIS J. LEBDA

I've received so many inquiries on that super-mike I'm publishing this letter and answer in Brass Tacks.

Write to Don Klipstein, Imagineering, Inc., 8023 Stenton Avenue, Philadelphia, Pa. 19150. He's getting the microphones into production. Projected cost of one good from 0.1 cycle to 250,000 cycles—about $6. For one good to 10 megacycles—about $20. Over those ranges, they are both phase and frequency flat.

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EDITORIAL

continued from page 7

have been maimed have never been near a war zone, you know.)

The work military research has done is of great help now in the continuing work of trying to make up for the losses of the thalidomide babies.

Prosthesis research is typical of why military-industrial complex research is necessary. No individual could afford the cost of the necessary research, or arrange the necessary experiments. It isn't the sort of intellectual triumph that could satisfy an ivory-tower academic researcher. People somehow prefer not to notice the maimed—the "freaks." Only the military forces have had the decency to try to do something about the problem. And it was the military research of Colonel Stapp that developed seat belts to reduce the maiming. Maybe it's that that makes so many spurn their use!

The great advantage of military financed research over the academic type is, simply, that the military is hard-boiled, hard-headed, ruthlessly pragmatic, and rigidly demanding. They want answers, and want 'em *now!* No "we'll solve that problem one of these days, I'm sure, General. . . ."

They aren't even really concerned that they're interrupting somebody's pet dedication to the exact metabolic pathway of nerve impulses in squids, but cruelly demand he find a way to make a nerve impulse trigger an electronic circuit to control a motor-driven prosthesis. "Sure, some sweet day the knowledge of the metabolism of a squid nerve might yield relevant fundamental knowledge—but we want this engineering device now. The thalidomide babies don't need it seventy-five—one hundred years hence; they need it *now*! Yes, I *know* you won't get any scientific papers out of a successful job of bioengineering—no kudos for making a leg that can walk—but *that's what's needed*!"

Contrary to the academic's deep conviction, engineering technology normally *precedes* science—how-to-do-it can be worked out without knowledge of why it works. This does *not* deny that the scientific approach is invaluable; it simply insists on recognition of facts: Technology can exist without science. Damascus armorers were making extremely fine quality spring steel long before the rudiments of metallurgical science. Many of the most valuable drugs in the pharmacopoeia were in standard use before biochemistry—or even chemistry!—was invented. The witch doctors, not the scientists, got medicine started. (Heroin is a result of scientific research; opium is relatively non-habit-forming. Witch-doctor medicine was safer than the scientific product!)

Take a little time off, and make a

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list of all the things that military research has provided for us—and the baby-with-the-bath-water syndrome of our student fanatics becomes more obvious.

But that's all right—you can expect that sort of irrationality in any culture. From here, as I say, to the farther galaxies of Coma Berenices. The conflict arises from the unadulterated fanatic-idealist and the pragmatic frontiersmen. The well-protected idealist, who is not faced with the hard, ruthless realities of the frontier, and violently resents the harsh discipline such realities impose on an entity, despises the frontiersman who reflects those harsh realities back to him.

The frontiersman *has* to be rigidly disciplined—he must learn the importance of discipline, and accept it at the level of self-discipline, if he is to survive. And he gets to expect similar self-discipline and pragmatic realism in others.

The consequence is that his pattern of thinking is extremely irritating to the academic, the sheltered-from-harsh-realities idealist.

The military represents the "friction surface" of the nation against external cultures; like the skin, it has to be tough, abrasion resistant, lethal to invaders, elastic, and resistant to corrosion.

The military teams up fairly well with the industrial complex—as the skin does with the muscles. Industry, too, is heavily exposed to realities—the realities of competition, economic pressures that must be borne, public demands. Industry is, in fact, extremely democratic in its reactions; what the people want, industry tries hard to supply. What they don't want, industry immediately ceases to manufacture. (Try buying a treadmill on which a horse can work to drive "powered" machinery. There were several versions listed in the 1902 Sears Roebuck catalog, when people wanted them.)

Industry learns to pay attention to what the real situation is, to keep an alert intelligence network in action, and to keep close track of competitors.

So do military organizations; they have similar problems, because both are directly competitive systems. They talk the same language of pragmatic realities—results, not hopes, not logically conclusive theories, are the criteria they must yield to. And they are, therefore, ruthlessly pragmatic in dealing with lovely ideas that don't work, or blow up in your face when you try to live by them.

Yet fanatics tend to get far more favorable notice in the press; they make better copy. Example: Recently a civil engineer who decided that he was an expert on nutrition, appeared before a Washington investigation, and reported on how terrible the commercial breakfast foods were. He got nationwide front-page publicity.

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Now among his more brilliant remarks was that, on his home-brewed method of rating foods, 100% bran was practically at the top of the list as a fine food, while Shredded Wheat—100% whole wheat—was way down at the very bottom of the list as having practically no nutritive value.

Bran is, by definition, the husks of the wheat grains; cows, termites, and other animals that keep a vat of bacteria in their gut to digest cellulose for them, can extract nutrition from bran. Human digestive systems can't; it's beneficial only as roughage. The wheat plant stores the growth-energy for the next generation in the grain, not the husk. Our well-publicized nutrition expert would, on this basis, hold that the plastic film your hamburger comes in was excellent nutrition, but the meat should be ignored.

Inasmuch as several hundred generations of men have managed to survive handily eating that no-good whole wheat as a major item of diet, I have reason to doubt the guy knows what he's talking about. But *he* gets national front-page reporting!

The nutrition experts who testified later, of course, were quoted in a couple inches of type on Page 4 or so.

A fool with a fanaticism can get a pack of not-too-clear-thinking idealists to follow his lead in a Holy Cause to destroy the Awful Demon, whether it be the Demon Rum—to be destroyed at last by Prohibition; or the Demon Military Research—to be driven forever from our enlightened campuses.

If they did succeed in driving out military research, that research has to be carried on, and if prosthetics research can't be continued at a medical school, why the highly competent professors who are doing the research will be moved off campus. The research won't stop—but just think what great opportunities that opens up for incompetent professors that the military rejected! Drive the computer research off campus, and guess what sort of people will be left on campus to teach computer technology. Drive the nuclear physicists off campus—and the nuclear research tools that are essential to learn how to be a nuclear physicist go with them. The nation, not the university, supplies the money necessary for those great tools.

Oh . . . you want all nuclear research discontinued?

Have you decided to learn Russian or Chinese?

This is a competitive world, friend—whether you like it that way or not.

There are other people who do.

And there isn't the slightest use moving to that further galaxy in Coma Berenices; their evolution to intelligence worked out the same way.

The Editor

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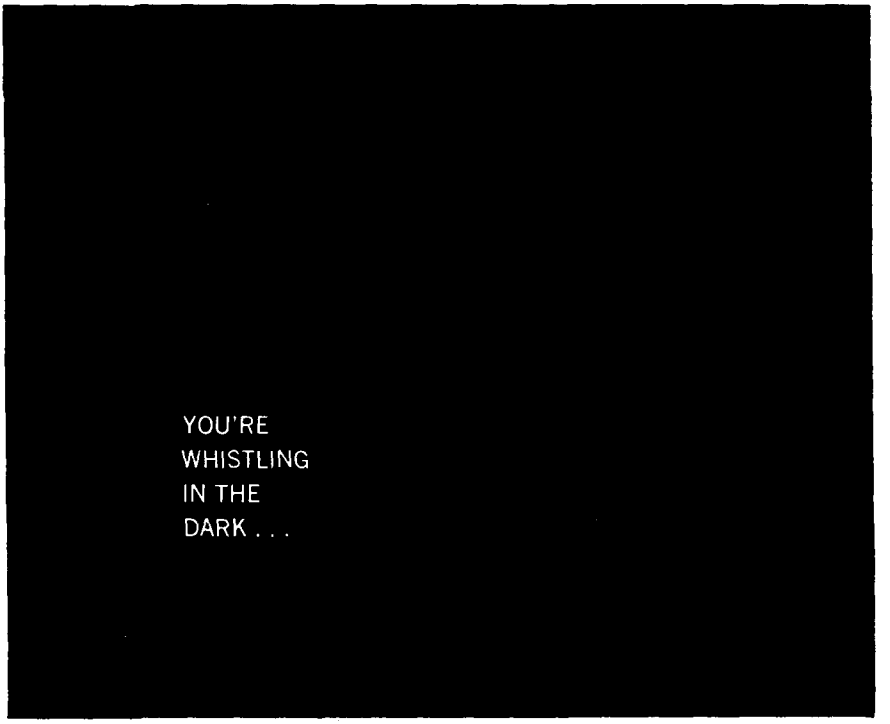

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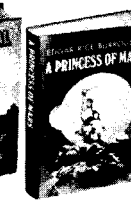

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